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# SINGLE STAGE EXPERIMENTAL EVALUATION OF VARIABLE GEOMETRY GUIDE VANES AND STATOR BLADING

## PART IV - DATA AND PERFORMANCE FOR VARIABLE CAMBER GUIDE VANE AND STATOR B

BY

B.A. JONES AND R.P. OSCARSON

Prepared For
National Aeronautics And Space Administration

Contract NAS3-7604

Pratt & Whitney Aircraft DIVISION OF UNITED AIRCRAFT CORPORATION
FLORIDA RESEARCH AND DEVELOPMENT CENTER
BOX 2691, WEST PALM BEACH, FLORIDA 33402

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Technical Management
NASA Lewis Research Center
Cleveland, Ohio

NASA Program Manager: James J. Watt
Air Breathing Engines Division

NASA Research Advisor: L. Joseph Herrig
Fluid Systems Components Division

Pratt & Whitney Aircraft DIVISION OF UNITED AIRCRAFT CORPORATION
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## ABSTRACT

A single-stage experimental investigation was conducted to determine the extent that a variable camber inlet guide vane and a two-part stator having adjustable leading and trailing edge metal angles can increase the stable operating range of a compressor front stage. The stage was designed with zero rotor prewhirl at design equivalent rotor speed (SLTO conditions) and 35-degree hub - 20-degree tip prewhirl at 70% of design rotor speed (high Mach number cruise conditions). The cruise configuration permitted stable operation at a lower flow for a given speed than those attainable with the SLTO configuration. At cruise rotor speed and flow conditions, the adiabatic efficiency of the cruise configuration was approximately 7% higher than that of the SLTO configuration.

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## SUMMARY

An experimental investigation was conducted with a 0.5 hub/tip ratio single-stage compressor to determine the extent that a variable camber guide vane and a two-part stator having adjustable leading and trailing edge metal angles can extend the range of stable compressor operation. The stage, which resembled the front stage of a typical high cruise flight Mach number compressor, was designed with zero rotor prewhirl at design equivalent rotor speed (sea level takeoff, SLTO conditions), and 35-degree hub - 20-degree tip prewhirl at 70% of design rotor speed (high Mach number cruise conditions). The design rotor tip relative Mach number for the SLTO configuration was 1.15, and the design stage pressure ratio and efficiency were respectively 1.32 and 85.1%. The SLTO configuration was tested over a range of speeds from 50 to 110% of design equivalent rotor speed. The cruise configuration and an intermediate configuration (approximately halfway between the SLTO and cruise IGV and stator settings) were tested from 50 to 100% of design equivalent rotor speed. Design performance goals were met with the SLTO and cruise configurations. The cruise configuration permitted stable operation at a lower flow for a given speed than that attainable with the SLTO configuration. At cruise rotor speed and flow conditions, adiabatic efficiency was approximately 7% higher for the cruise configuration. Moreover, the cruise configuration exhibited a substantial improvement in stall margin over that obtained with the SLTO configuration in the range of rotor speeds between 50 and 80% of design equivalent rotor speed. The intermediate setting of the guide vanes and stator (halfway between the SLTO and cruise configurations) resulted in flow reductions at SLTO and cruise design pressure ratio equal to approximately 40% of the reduction in flow between the SLTO and cruise configuration. The stall limit flow for the intermediate configuration at cruise rotor speed

was approximately 2% less than that for the SLTO configuration and 10% greater than that for the cruise configuration.

## INTRODUCTION

The supersonic cruise operating point of fixed-geometry front stages of turbojet engine compressors tends to approach the stall line as cruise Mach number increases. This results from the flow limitation in the compressor rear stages at cruise rotor speed and pressure ratio conditions. This imposes a reduction in compressor inlet flow and axial velocity below that for which the front stages are designed to operate efficiently. When the reduction in front-stage axial velocity becomes proportionally greater than the reduction in blade tip velocity, rotor incidence angle increases above the sea level takeoff design value. If the increase in incidence angle is sufficiently large, the front stage(s) may be subject to stall, which can lead to reduced compressor performance and possibly to compressor surge. One approach in overcoming this problem is to provide mechanical adjustment of the guide vane and stator leading and/or trailing edge metal angles to permit selection of the proper stage velocity triangles over the required operating range.

A single-stage compressor experimental investigation was conducted to evaluate the extent to which variable geometry concepts can be applied to increase the stable operating range of a compressor front stage. A variable camber inlet guide vane, rotor, and two variable geometry stator configurations were designed, fabricated, and tested over a range of equivalent rotor speeds from 50 to 110% of the design rotor speed. The stage was designed with zero rotor prewhirl at design equivalent rotor speed and 35-degree hub - 20-degree tip prewhirl at cruise conditions. Design point (sea level takeoff, SLTO) equivalent rotor speed and flow were respectively 6050 rpm and 265 lb/sec; off-design (simulated high Mach number cruise) equivalent rotor speed and flow were respectively 4235 rpm and 143 lb/sec.

The variable-camber guide vanes comprised modified 63-series airfoil sections and were configured with a fixed leading-edge segment and two articulated flap segments. The rotor, designed with circular arc airfoils, had a tip inlet relative Mach number of 1.15. The stator configurations, comprised of 65-series airfoil sections, were designed to turn the flow back to the near axial direction at the SLTO operating point and to provide a (hypothetical) 2nd-stage rotor prewhirl distribution of approximately 30-degree hub - 25-degree tip at the cruise operating point. One stator design had a fixed-geometry leading edge and an adjustable trailing edge (Stator A), and the other stator design had adjustable leading and trailing edge geometry (Stator B).

Details of the experimental stage aerodynamic and mechanical design are presented in Reference 1. The results of an annular cascade test program for the preliminary evaluation of candidate variable geometry concepts are presented in Reference 2. The data and performance obtained with the variable camber guide vane, rotor, and Stator A are presented in Reference 3. This report presents the data and performance obtained with the variable camber guide vane, rotor, and Stator B design that had variable leading and trailing edge geometry. The variable-geometry stage was tested with the guide vanes and stator in their SLTO position, cruise position, and an intermediate position halfway between the SLTO and cruise positions.

# TEST EQUIPMENT

## Facility

The compressor test facility is shown in figure 1. The compressor rotor is driven by a single-stage free turbine that is powered by exhaust gases from a J75 slave engine. Drive turbine speed is controlled by means of the engine throttle. Air entered the compressor test section through a 103-ft combined inlet duct, plenum, and bellmouth inlet and exhausted through an exit diffuser to the atmosphere. A 7-degree diffuser at the plenum inlet and 10:1 bellmouth contraction ratio ensured uniform flow conditions at the compressor inlet.

## Compressor Test Rig

The compressor rig, shown in figure 2, comprises bellmouth inlet, test section , and exhaust section. The rotor assembly and shaft are supported on two bearings that transmit loads to the outer case through the stationary leading-edge segments of the variable-geometry inlet guide vanes and the struts in the exhaust case. A set of motor-driven throttle vanes is located in the exhaust case to vary flowrate. A section view of the flowpath is shown in figure 3. The guide vane inlet station is preceded by a flow-straightening section approximately 10-in. long. The inner flowpath wall converges from a diameter of 18.70 in. at the guide vane inlet to a diameter of 25.60 in. at the stator exit. The outer wall diameter converges slightly from 43.20 to 42.10 in. The hub/tip ratio at the rotor leading edge is 0.492. In general, the flowpath is designed to resemble the front-stage environment of a state-of-the-art high cruise Mach number compressor. The blade rows were spaced sufficiently apart to permit the installation of instrumentation.

A machined aluminum shroud was used for the rotor to prevent damage to the blade tips in the event a rub occurred during operation near or in stall. The nominal blade tip clearance was 0.050 in.

## Blading Design

### Inlet Guide Vane

The variable camber inlet guide vane was designed to provide axial inlet flow (zero swirl) in the SLTO configuration and 35-degree hub - 20-degree tip swirl distribution in the cruise configuration. Slightly-modified 63-series airfoil sections were used. The basic camber was selected to provide approximately two-thirds of the anticipated air turning requirement at the cruise operating point.

The SLTO and cruise positions were achieved by actuating two articulated flap segments in the appropriate direction to reduce or increase camber angle from the basic design camber angle. A photograph of the guide vane is shown in figure 4. Guide vane geometry details are summarized in table 1a; symbols are defined in Appendix A. Table 1a includes the leading and trailing edge metal angles for an intermediate guide vane setting that was tested following the tests with the SLTO and cruise geometries. Additional design information for the inlet guide vane is presented in Reference 1.

### Rotor

The rotor was comprised of 34 blades, designed with circular-arc airfoil sections. The design point inlet relative Mach number at the tip was 1.15 and the design diffusion factor was nominally 0.40. Blade chord length and solidity were representative state-of-the-art values for a high cruise Mach number front stage. A part span shroud was added at 40% span from the tip to reduce blade resonance stress. Rotor geometry details are summarized in table 1b, and additional rotor design information is contained in Reference 1.

Table 1. Design Data

a. Inlet Guide Vane Geometry

Airfoil Series: 63
No. of Blades: 20
Aspect Ratio: 2.642
Thickness Ratio: 0.09

SLTO Configuration

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ | $\phi$ | $\gamma°$ | c | $\sigma$ | $\delta°$ |
|---|---|---|---|---|---|---|---|
| 90 | -20.2 | 5.4 | 25.6 | 1.2 | 4.55 | 1.412 | Approximately |
| 70 | -20.2 | 3.7 | 23.9 | 0.5 | 4.55 | 1.245 | 1.0 Degree |
| 50 | -20.2 | 1.9 | 22.1 | -0.2 | 4.55 | 1.080 | Estimated |
| 30 | -20.2 | 0.3 | 20.5 | -0.9 | 4.55 | 0.913 | |
| 10 | -20.2 | -1.6 | 18.6 | -1.6 | 4.55 | 0.748 | |

Cruise Configuration

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ | $\phi$ | $\gamma°$ | c | $\sigma$ | $\delta°$ |
|---|---|---|---|---|---|---|---|
| 90 | -20.2 | 36.0 | 56.2 | 21.1 | 4.47 | 1.412 | 2.2 |
| 70 | -20.2 | 34.3 | 54.5 | 20.5 | 4.47 | 1.245 | 3.2 |
| 50 | -20.2 | 32.5 | 52.7 | 19.9 | 4.47 | 1.080 | 4.3 |
| 30 | -20.2 | 30.9 | 51.1 | 19.2 | 4.47 | 0.913 | 5.9 |
| 10 | -20.2 | 29.0 | 49.2 | 18.5 | 4.47 | 0.748 | 7.1 |

Intermediate Configuration

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ |
|---|---|---|
| 90 | -20.2 | 20.7 |
| 70 | -20.2 | 19.0 |
| 50 | -20.2 | 17.2 |
| 30 | -20.2 | 15.6 |
| 10 | -20.2 | 13.7 |

Table 1. Design Data (Continued)

b. Rotor Geometry

Airfoil Series: Circular Arc
No. of Blades: 34
Aspect Ratio: 2.829

<u>SLTO Configuration</u>

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ | $\phi$ | $\gamma°$ | $i_m$ | c | $\sigma$ | t/c | $\delta$ | $\bar{\omega}'$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 90 | 48.6 | 18.8 | 29.8 | 31.2 | 1.4 | 3.24 | 1.42 | 0.0744 | 6.1 | 0.024 |
| 70 | 52.5 | 32.5 | 20.0 | 41.2 | 1.4 | 3.43 | 1.30 | 0.0641 | 4.3 | 0.024 |
| 50 | 56.1 | 42.1 | 14.0 | 48.2 | 1.2 | 3.63 | 1.20 | 0.0542 | 3.8 | 0.033 |
| 30 | 59.6 | 48.6 | 11.0 | 53.6 | 0.4 | 3.82 | 1.12 | 0.0445 | 3.3 | 0.058 |
| 10 | 63.2 | 52.9 | 10.3 | 57.9 | 0.0 | 4.01 | 1.06 | 0.0355 | 3.8 | 0.097 |

<u>Cruise Configuration</u>

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ | $\phi$ | $\gamma°$ | $i_m$ | c | $\sigma$ | t/c | $\delta$ | $\bar{\omega}'$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 90 | Same as SLTO Configuration | | | | -1.7 | Same as SLTO Configuration | | | 6.2 | 0.030 |
| 70 | Same as SLTO Configuration | | | | 2.3 | Same as SLTO Configuration | | | 4.3 | 0.018 |
| 50 | Same as SLTO Configuration | | | | 4.3 | Same as SLTO Configuration | | | 2.9 | 0.030 |
| 30 | Same as SLTO Configuration | | | | 4.9 | Same as SLTO Configuration | | | 2.3 | 0.064 |
| 10 | Same as SLTO Configuration | | | | 4.5 | Same as SLTO Configuration | | | 2.5 | 0.125 |

Table 1. Design Data (Continued)

c. Stator B geometry

Airfoil Series: 65
No. of Blades: 40
Aspect Ratio: 2.939
Thickness Ratio: 0.08

SLTO Configuration

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ | $\phi$ | $\gamma°$ | $i_m$ | c | $\sigma$ | $\delta°$ | $\bar{\omega}$ |
|---|---|---|---|---|---|---|---|---|---|
| 90 | 40.9 | -8.7 | 49.6 | 16.0 | -4.2 | 2.75 | 1.28 | 12.8 | 0.026 |
| 70 | 37.1 | -7.5 | 44.6 | 14.5 | -3.3 | 2.88 | 1.19 | 10.1 | 0.025 |
| 50 | 34.7 | -7.5 | 42.2 | 13.5 | -3.2 | 3.00 | 1.12 | 9.3 | 0.026 |
| 30 | 34.0 | -8.0 | 42.0 | 13.2 | -3.2 | 3.13 | 1.07 | 9.8 | 0.029 |
| 10 | 36.0 | -8.9 | 44.9 | 13.5 | -4.8 | 3.27 | 1.02 | 11.0 | 0.032 |

Cruise Configuration

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ | $\phi$ | $\gamma°$ | $i_m$ | c | $\sigma$ | $\delta°$ | $\bar{\omega}$ |
|---|---|---|---|---|---|---|---|---|---|
| 90 | 49.9 | 17.3 | ---- | ---- | -2.2 | ---- | 1.28 | 11.9 | 0.040 |
| 70 | 46.1 | 18.5 | ---- | ---- | 1.7 | ---- | 1.19 | 9.0 | 0.038 |
| 50 | 43.7 | 18.5 | ---- | ---- | 3.2 | ---- | 1.12 | 8.2 | 0.030 |
| 30 | 43.0 | 18.0 | ---- | ---- | 3.2 | ---- | 1.07 | 8.4 | 0.024 |
| 10 | 45.0 | 17.1 | ---- | ---- | 1.2 | ---- | 1.02 | 9.3 | 0.027 |

Intermediate Configuration

| Percent Span (from tip) | $\kappa_1$ | $\kappa_2$ |
|---|---|---|
| 90 | 45.4 | 4.3 |
| 70 | 41.6 | 5.5 |
| 50 | 39.2 | 5.5 |
| 30 | 38.5 | 5.0 |
| 10 | 40.5 | 4.1 |

## Stator B

A photograph and section view of Stator B are shown in figure 4. The design point geometry was developed from 65-series airfoil sections; the vanes were designed to preserve as much as possible of the basic 65-series airfoil shape. Pursuant to this objective, the two flap segments were selected to have approximately the same chord length and an overlap of 15% of the basic 65-series chord length. The leading edge of the forward flap is identical to the basic 65-series airfoil up to 30% of the forward flap chord. The geometry of the remainder of the forward flap was generated by combining the thickness distribution for a 65-series airfoil (having a chord length equal to the flap chord and thickness at 30% chord as defined by the basic airfoil) with the basic airfoil suction surface contour. For the rear flap, the uncovered section (55 to 100% of the basic airfoil chord) is identical to the basic 65-series airfoil geometry. A NACA-4-digit series airfoil shape was used for the covered leading edge section (40 to 55% basic chord) to permit low-loss operation over a wide range of incidence angles. A small slot was provided between the two segments in this position to reduce recirculation in the pressure surface cavity that is formed by the two segments.

Minimum loss incidence angle, loss, and deviation angle for the SLTO geometry airfoil were predicted from conventional 65-series airfoil cascade data. Midspan values of stator inlet Mach number and diffusion factor were 0.56 and 0.33, respectively. Additional design information is presented in Reference 1.

To obtain the desired incidence and exit angle distributions for operation at the cruise conditions, the forward segment was rotated to increase the leading edge metal angle 9 degrees and the rear segment was rotated to increase the trailing edge metal angle 26 degrees. The net effect was a decrease in camber angle of 17 degrees. For the intermediate geometry setting, the forward segment was rotated 4.5 degrees and the rear segment was rotated 13 degrees. Stator design details are presented in table 1c.

## Instrumentation

Instrumentation was provided to obtain overall and blade element performance data for each blade row. Axial locations of instrumentation stations are indicated in figure 2 and the circumferential locations of instrumentation at each axial station is shown in figures 5 through 7.

Airflow was measured with an ASME standard thin-plate orifice located in the inlet duct, as indicated in figure 1. Inlet total pressure and temperature were measured in the plenum by means of three Kiel-type total pressure probes and six half-shielded total temperature probes. Four equally spaced static pressure taps were located on both the inner and outer wall at Station 0. The static pressure measurements at this station were used to check the orifice weight flow.

Air angles were measured by means of 20-degree wedge traverse probes. Behind the inlet guide vane and stator these probes were located circumferentially as required to keep them out of vane wakes. Each 20-degree wedge probe includes a total pressure tube for total pressure measurement as shown in figure 8.

Total pressure measurement behind the guide vane and stator was accomplished by means of two stationary wake probes at each station. One wake probe had sets of 14-tube rakes at 10, 50, and 90% span locations; the other wake probe had sets of 14-tube rakes at 30 and 70% span locations. The angle settings of both the rake heads and the probe stem were selected to permit alignment with the airstream within approximately $\pm 5$ degrees for both SLTO and cruise geometry. The acceptance yaw angle (pressure accuracy within $\pm 1\%$ of $P - p$) of the rake tubes is $\pm 10$ degrees. The wake probe was translated circumferentially to keep the wake centered on the rakes when the guide vane and stator flaps were in the cruise position. A typical rake head is shown in figure 9. The 20-degree wedge traverse probes used for air angle measurement behind the guide vane and stator also measured total pressure, which provided a check on the midchannel total pressures obtained with wake probes. Total pressures behind the rotor were measured with the two 20-degree wedge traverse probes and two radial rakes with Kiel heads at 10, 30, 50, 70, and 90% span. The traverse probes and radial rakes were spaced so as to approximately average the circumferential total pressure profile generated by the inlet guide vanes. Total temperatures were measured behind the stator using Kiel-type probes mounted on four radial rakes. The temperature rakes were spaced as shown in figure 7; they were located with respect to each other at 0, 1/4, 1/2, and 3/4 of a guide vane gap. Total pressure and temperature rakes are shown in figure 10.

Radial distribution of static pressures behind the guide vanes, rotor, and stator were measured by means of 8-degree wedge traverse probes, which are shown in figure 11. Four approximately equally spaced static pressure taps were provided on the inner and outer walls behind the guide vane and stator. Four taps were located on the inner wall and twelve taps were located on the outer wall behind the rotor. The eight additional outer wall taps behind the rotor were spaced across a guide vane gap to determine the static pressure variation associated with guide vanes wakes and/or stator flow fields.

Three Kistler high response pressure transducers were installed approximately 30 and 60 degrees apart at 10% span behind the rotor to measure the number, size, and rotational speed of rotating stall zones.

Rotor blades and stator vanes were instrumented with strain gages to measure torsional and bending stresses.

Rotor speed was measured with an electromagnetic sensor mounted adjacent to a 60-tooth gear on the rotor shaft. Gear-tooth-passing frequency was displayed as rpm on an Anadex digital counter.

Steady-state pressure measurements were recorded on a scannivalve multichannel pressure transducer system. Traverse probe data (total and static pressures, air angle, and radial position) were recorded on magnetic tape at the rate of 60 samples (2.0 in. probe travel) per minute. Temperatures were indicated on precision potentiometers and manually recorded.

Orifice static pressure, bellmouth static pressure, plenum pressure, and representative stage exit pressure instrumentation were close-coupled to transducers for high response transient recording of flow and pressure ratio during operation into and out of stall. Similar instrumentation was connected to manometers in the control room to permit setting the desired steady-state pressure ratio and flow conditions.

## PROCEDURES

### Test Procedure

Overall and blade element performance data were obtained at three settings of the variable camber inlet guide vane and variable geometry Stator B: sea level takeoff, cruise, and an intermediate setting approximately halfway between the SLTO and cruise settings. Data were obtained at 50, 70, 80, 100, and 110 percent of design equivalent rotor speed with the SLTO configuration, and 50, 70, 80, and 100 percent of design rotor speed with the cruise and intermediate configuration. Data points were distributed between maximum flow and near stall flow at each rotor speed.

For the SLTO configuration, points near stall at 100 and 110% of design speed were obtained with a reduced inlet pressure (approximately 11 psia) because of the test stand horsepower limit. For each data point the fixed pressure and temperature instrumentation data were recorded with the traverse probes withdrawn. The traverse probes were subsequently immersed in the airstream and recorded as they were traversed from the inner to the outer wall.

The compressor was operated into and out of stall at each of the test rotor speeds; orifice and bellmouth static pressures, exit total pressure, and rotor speed were recorded on magnetic tape at the rate of 600 samples per minute. Kistler transducer data were also recorded during the excursions into stall to define the rotating stall patterns. Time correlation between the Kistler and stall transient pressure recordings permitted correlation of the Kistler and stall transient data.

## Data Reduction Procedure

Data reduction was accomplished in four steps. Initially, the raw data compiled on magnetic tape and IBM cards were converted to engineering units that were subsequently recompiled on a storage tape and tabulated for preliminary inspection. The second data reduction step accomplished the following:

1. Mach number corrections, as required, for traverse probe data
2. Correction of pressure and temperature data to NASA Standard Day conditions
3. Mass averaging of guide vane and stator wake pressures (these were subsequently performed in a separate computer program)
4. Calculation of corrected flow
5. Calculation of radial distribution of flow parameter (for radial mass flow averaging of total pressures in subsequent procedure)
6. Circumferential arithmetic averaging of fixed and traverse instrumentation data.

The results of this data reduction step were printed to permit a more detailed inspection of the data to eliminate apparent inconsistencies prior to the calculation of performance and vector diagram variables.

Pressure ratios were calculated for the rotor, guide vane-rotor, and the entire stage. Stage inlet total pressure was corrected to the NASA Standard Day conditions, 14.69 psia. The guide vane, rotor, and stator exit total pressures were weighed according to local mass flow to obtain the average values. The guide vane and stator wake total pressures at each radial measuring station were mass-averaged using the local total pressures in the wake and the 8-degree wedge probe static pressure to define the local Mach numbers. Mass flux was then obtained from the relationship

$$\bar{m} = \frac{W\sqrt{T}}{PA} = \sqrt{\gamma g/_R} \quad M\left[1 + \frac{\gamma-1}{2} M^2\right]^{1/2} \quad p/P$$

where T is measured total temperature and A is the flow area associated with each total pressube tube. With the radial distribution of total pressure and mass flux thus calculated, the total pressures were mass-averaged in the radial direction. Behind the rotor, the total pressures obtained with the two 20-degree wedge probes were arithmetically averaged, and the resulting radial distribution was mass-flow-averaged using the 8-degree wedge probe static pressure and stator exit radial temperature distribution to define weight flow.

Performance and vector diagram calculations were performed two ways: one method used the measured static pressure distributions to define the velocity distributions at each axial station; the second method, a streamline analysis, calculated a static pressure distribution that satisfied radial equilibrium and continuity. For the streamline analysis calculation, adjustments could be made to an input boundary layer displacement factor to achieve agreement between the calculated and measured static pressure. The primary purpose for using the streamline analysis computer program was to permit translation of the velocity diagram data from instrumentation axial stations to the respective adjacent blade row leading and trailing edge stations for comparison with the design velocity diagram results (Reference 1). The translation was performed with the assumption of isentropic flow and constant angular momentum along design stream annuli whose centers intersected each blade row leading edge at 10, 30, 50, 70, and 90% span positions from the tip. The velocity diagram data presented herein were calculated by means of the streamline analysis computer program and correspond to the leading and trailing edges of the rotor and stator blade rows as defined by the dashed lines in figure 3. Loss coefficient calculations for the guide vane and stator were performed in a separate computer program to permit use of the wake freestream total pressure as the upstream pressure and to permit the elimination of certain rake tube pressures that were apparently faulty and affected the credibility of the calculated loss coefficient. Rotor overall performance and loss coefficients were based on inlet total pressures that resulted from integration of the as-measured guide vane wake pressures. The discrepancies in guide vane wake pressures that influenced guide vane loss coefficients had a negligible effect on the calculated rotor loss. Because of the sensitivity of the calculated rotor blade relative total pressure to static pressure, the rotor loss coefficients were based on the static pressure values measured at the instrumentation stations rather than those calculated for the leading and trailing edge stations. Consequently, the loss coefficient data for the three blade rows correspond to the instrumentation stations upstream and downstream of each blade row (along the aforementioned design streamline) rather than to the blade row leading and trailing edges.

## PRESENTATION OF DATA

### Overall Performance

Overall performance data are presented in terms of pressure ratio and adiabatic efficiency as functions of corrected weight flow, $W\sqrt{\theta}/\delta$ ; specific weight flow, $W\sqrt{\theta}/\delta A_A$; and equivalent rotor speed, $N/\sqrt{\theta}$ . Overall performance is also summarized in terms of pressure rise coefficient, $\Psi$, as a function of flow coefficient, $\Phi$ . Definitions of calculated performance variables and symbols are presented in Appendix A.

Pressure ratio and efficiency for the rotor, guide vane-rotor, and guide vane-rotor-stator B are presented respectively in figures 12, 13, and 14 for the SLTO configuration; in figures 15, 16, and 17 for the cruise configuration; and in figures 18, 19, and 20 for the intermediate configuration. The dashed-line portion of the curves in figures 14, 17, and 20 refer to transient data, and the data point on the stall line is the incipient stall point determined from the transient data. The corrected flows and pressure ratios for steady-state data points are tabulated in table B-1. Efficiency contours are presented for the three configurations in figure 21, and the pressure rise coefficient, $\Psi$, is presented as a function of the flow coefficient, $\Phi$, in figure 22.

Two qualifying statements must be made concerning the efficiency data presented in figures 12, 13, 15, 16, 18, and

19. First, the mass-average temperature used in the efficiency calculations was based on the temperature and flow distributions measured at Station 2A downstream of the stator. Redistribution of the flow through the stator may produce a slight difference between the mass-average temperature behind the rotor and the value based on stator exit conditions. This temperature difference would be reflected in the rotor and guide vane-rotor efficiencies. The second qualification concerns the use of measured guide vane wake total pressure (as discussed under Data Reduction Procedure) in the calculation of rotor pressure ratio and efficiency. Discrepancies in rotor efficiency, resulting from observed discrepancies in the guide vane wake profiles, are within ±1.0 percent.

Although the performance levels in figures 12, 13, 15, 16, 18 and 19 are generally correct for the rotor and guide vane-rotor combination, a more valid assessment of stage and blade-row performance is presented in the overall performance data in figures 14, 17, and 20, and the detailed blade element data in the following section.

Figure 14 indicates that the SLTO configuration slightly exceeded its predicted performance. The predicted stage pressure ratio and efficiency were 1.32 and 85.1% compared with measured values of 1.347 and 87.8% at the design flowrate. The higher measured performance is partially attributable to slightly high rotor tip loading due to slightly negative swirl produced by the guide vanes in their SLTO position, as seen in figure 23.

(Note in figures 12 through 14 and in table B-1 that only three data points were processed for the 110% of design rotor speed condition. Discrepancies in the plenum pressure measurement were noted for the other three data points, which resulted in questionable performance values. The source of error was not discovered and the three questionable data points were, therefore, omitted from the data presentation).

Figure 17 shows that the predicted stage pressure ratio of 1.129 and efficiency of 88.3% for the cruise configuration geometry were exceeded with a measured pressure ratio of 1.15 and corresponding efficiency of 90% at the cruise design flow.

The intermediate configuration efficiency for cruise design flow in figure 20 is about halfway between the SLTO and cruise configuration efficiencies for the same flow in figures 14 and 17. The corresponding pressure ratio for the intermediate configuration was close to that obtained with the SLTO geometry. The improvement in efficiency at cruise design conditions, as the stage geometry was changed from the SLTO configuration to the cruise configuration, is indicated by the efficiency contours in figure 21.

The pressure coefficient-flow coefficient characteristics in figure 22 indicate that the SLTO and cruise configurations are fairly well matched with their respective design conditions.

## Blade Element Performance for Sea Level Takeoff Configuration

### Inlet Guide Vane; SLTO

Guide vane exit air angle distributions for the sea level takeoff configuration are presented in figure 23. The design distribution is shown for comparison with the data. The distribution in figure 23 indicates only a slight variation from the zero swirl design distribution. The swirl distribution corresponding to design flow imposed slightly higher incidence on the rotor tip relative to design incidence conditions. The wide variation of swirl angle with flow in the tip region is attributable to (1) influence of the rotor on the static pressure gradient in the tip region ahead of the rotor and (2) possible influence of the relief cut in the tip of the guide vane flap to permit wall clearance in the cruise configuration. A similar trend of tip region swirl angle variation with flow was noted in the Stator A test program reported in Reference 3.

Guide vane loss coefficient for the hub, mean, and tip sections are presented in figure 24. Because the guide vane loss coefficients were calculated in a separate computer program and involved the detailed inspection of each guide vane wake, only the data for the 70 and 100% design rotor speeds at the hub, mean, and tip sections were processed. These results provide assessment of the guide vane losses with respect to spanwise variation and Mach number. The loss coefficient values obtained with the Stator A SLTO configuration of Reference 3, also presented in figure 24, indicate good agreement with the Stator B SLTO configuration results.

Guide vane velocity diagram data for all five spanwise measuring stations are presented in table B-2.

Rotor; SLTO

The rotor inlet relative Mach number and air angle distributions achieved with the variable camber guide vane and Stator B in the sea level takeoff position at design equivalent rotor speed are shown in figure 25. The distributions of both Mach number and air angle that correspond to near design flow are in good agreement with the indicated design distribution.

Rotor diffusion factor, deviation angle, and loss coefficient for design equivalent rotor speed are shown in figures 26 through 30. The measured diffusion factors and deviation angles are in generally good agreement with the design values.* The rotor losses are generally greater than the predicted values. Minimum loss incidence angles for the 10 and 30% span locations (figures 26 and 27) are approximately 4 degrees greater than the predicted incidence angles for minimum loss.

Static pressure measurements obtained behind the rotor at the outer wall locations shown in figure 6 are presented as a function of equivalent guide vane and stator blade gap in figure 31. The pressure distribution indicates two regions of high and low pressure relative to a guide vane gap and one region of high and low pressure relative to a stator gap. The circumferential variation in static pressure is considered to be associated with the stator flow field because (1) the measured guide vane wake at 10% span from the tip was relatively small (figure 32) and (2) the static pressure taps at Station 2 were in close proximity to the stator leading edge (figure 3).

The outer wall value of static pressure obtained from extrapolation of the 8-degree wedge traverse probe static pressure data is shown in figure 31. The extrapolated value is in good agreement with the average of the wall static pressures.

Additional rotor velocity diagram and blade element performance data are presented in table B-2.

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* The rotor diffusion factor design points presented in figures 23 through 27 are defined by the corresponding equation in Appendix A. This definition accounts for the effect of the streamline diameter change across the rotor. The effect of this change was significant in the rotor hub region. The predicted rotor diffusion factors presented in Reference 1 do not account for the streamline diameter change and should not be used for comparison with the data in these figures.

## Stator B; SLTO

Stator B inlet conditions for the sea level takeoff configuration are shown in figure 33. The air angle distribution for design flow is in fair agreement with the indicated design distribution. The Mach numbers for design flow are low relative to the design values between hub and midspan.

Stator B diffusion factor, deviation angle, and loss coefficient are presented as functions of incidence angle at the five spanwise measuring stations in figures 34 through 38. In general, the measured diffusion factor, deviation angle, and loss coefficient are in favorable agreement with the respective predicted values with the exception of the hub section loss coefficient, which is substantially greater than the predicted value.

Exit air angle distributions for the Stator B SLTO configuration are compared in figure 39 with the design exit air angle distribution. The measured air angles are slightly less (approximately 2 degrees) than the design values across the span.

Additional Stator B blade element data are presented in table B-2.

# Blade Element Performance for Cruise Configuration

## Inlet Guide Vane; Cruise

The swirl distribution achieved with the variable camber inlet guide vane in the cruise configuration at cruise (70% of design equivalent) rotor speed is compared with the design distribution in figure 40. The measured swirl distribution is relatively flat in the hub and tip regions with the exception of the unusually high angle at 10% span for the near stall flow conditions. The swirl distributions in figure 40 are characteristically different from the distributions obtained with the same guide vane configuration in the Stator A tests of Reference 3. Possible reasons for this difference will be discussed in the final report under the contract program. Guide vane loss coefficients for the hub, mean, and tip sections are presented as a function of Mach number in figure 41. Additional guide vane data are contained in table B-3.

## Rotor; Cruise

Rotor inlet relative Mach number and air angle achieved with the cruise guide vane configuration at cruise rotor speed are shown in figure 42. The measured Mach number distribution is close to the design Mach number distribution. The Mach numbers in the hub region are slightly high compared to the design values. The experimental values of inlet relative air angle for design flow agree with the design values between 10 and 50% span and increase to about 4 degrees higher than the design value at 90% span.

As a matter of interest, the relative air angle distribution obtained with the SLTO guide vane configuration at cruise rotor speed and flow conditions is included in figure 42 for comparative purposes. This comparison illustrates the high incidence angles that a fixed sea level takeoff geometry stage would encounter at the specified cruise conditions.

Rotor diffusion factor, deviation angle, and loss coefficient for cruise rotor speed conditions are presented in figures 43 through 47. In general, the experimental values compare well with the predicted values at all span locations. The rotor losses are slightly higher than predicted between the midspan and hub region. The minimum loss incidence angle in the tip region appears to occur at a lower incidence than the predicted minimum loss incidence.

## Stator B; Cruise

Stator B inlet conditions for the cruise configuration at cruise rotor speed are shown in figure 48. The experimental Mach number distribution for design flow is in good agreement with the design values. The experimental air angles for design flow agree with the design values in the hub and tip regions and are slightly higher at midspan.

Stator B diffusion factor, deviation angle, and loss coefficient for cruise configuration at cruise rotor speed are shown in figures 49 through 53. The measured diffusion factors are slightly lower than the values predicted for the design air turning at cruise conditions. Deviation angles are in good agreement with the predicted values. The stator losses are appreciably higher than the losses predicted for a conventional stator designed for the same air turning and operation at minimum loss incidence. The relatively high losses are attributed to the relatively broad wake generated by the two segments of the Stator B cruise configuration. A midspan wake total pressure profile for near cruise design flow conditions is shown in figure 54.

Exit air angles for the Stator B cruise configuration are compared with the design exit air angles in figure 55. Good agreement is seen between the measured and design air angle values, particularly for the cruise design flow point.

Additional Stator B velocity diagram and performance data for the cruise geometry configuration are presented in table B-3.

### Blade Element Performance for Intermediate Configuration

Blade element performance was obtained with the variable guide vanes and Stator B positioned midway between the SLTO and cruise configuration positions. The blade element performance results obtained with this configuration at the 70, 80, and 100% equivalent rotor speed operating conditions are presented in figures 56 through 69. In each figure the predicted design information for the SLTO and cruise operating points are presented for comparison with the data. Inlet guide vane exit air angles and losses are presented only for the 70 and 100% rotor speeds. Additional velocity diagram and blade element performance data for the intermediate configuration are presented in table B-4.

#### Inlet Guide Vane; Intermediate

Inlet guide vane swirl distributions for 70 and 100% design equivalent rotor speed conditions are shown in figure 56. The swirl distribution is similar to that obtained with the cruise geometry (figure 40).

Guide vane loss coefficient at the root, midspan, and tip sections for the 70 and 100% rotor speed conditions are presented in figure 57. The loss coefficient levels are similar to those obtained with the SLTO guide vane configuration.

#### Rotor; Intermediate

Rotor inlet relative Mach number and air angle distributions for the 70, 80, and 100% rotor speed conditions are shown in figure 58. The maximum and near stall flow data points are presented to show the overall range at each rotor speed condition.

Rotor diffusion factor, deviation angle, and loss coefficient are presented as functions of incidence angle in figures 59 through 63. The general agreement between experimental results and those predicted for the respective SLTO and cruise configurations indicates that the intermediate guide vane configuration permits the rotor to operate within its low-loss range at both SLTO and cruise rotor speeds. It should be recalled, however, that the intermediate configuration overall pressure ratio and flow did not match either the SLTO or cruise design conditions, and would not be a suitable fixed-geometry stage for the specified operating range.

Stator B; Intermediate

Stator inlet Mach number and air angle distributions for maximum and near stall flow conditions are compared in figure 64 with the SLTO and cruise design distributions.

Blade element performance for the Stator B intermediate configuration is presented in figures 65 through 69. The values of diffusion factor, deviation angle, and loss coefficient obtained with the intermediate position are consistent with SLTO and cruise configuration values.

## Stall Transient Performance

Stall transient data are presented in figures 70, 71, and 72 in terms of pressure ratio versus corrected weight flow. Each figure includes (1) the steady-state overall performance curve for reference, (2) the transient overall performance curve based on the arithmetic average of stage exit total pressures measured with a single radial rake, and (3) a tabulation of rotating stall pattern results derived from Kistler transducer data. The transient data pressure ratios may be less than or slightly greater than the steady-state (mass flow average) pressure ratios depending upon the radial rake position with respect to stator wakes.

The rotating stall patterns determined from the three Kistler transducers located at 10% span are characterized by a single stall zone that covers approximately one-half of the annulus (circumferentially) and rotates at about one-half of the rotor speed. The stall zone appearance is coincident with the stall point determined from the stall transient data. This point is indicated as point number (1) in the figures. When the throttle vanes are opened and the stage comes out of stall, the size of the stall zone diminishes, as indicated by the values of percent area tabulated for the last point number in each figure. For the SLTO configuration operating at 70% rotor speed (figure 71) the rotating stall zone disappeared after the stage's initial stall, and operation in stall was fairly steady. The stall zone reappeared as the stage was operated out of stall, and finally diminished in size as indicated in the figure. A similar result was obtained with the Stator A configuration of Reference 3.

A sample of the stall transient data and Kistler transducer traces are presented for the SLTO configuration operating at 100% rotor speed in figure 73. The method used for determining the rotating stall patterns from Kistler transducer data is discussed in Appendix C.

## CONCLUDING DISCUSSION

Tests were conducted with a 0.5 hub/tip ratio compressor stage comprising a variable camber inlet guide vane, rotor, and a variable geometry stator having adjustable leading and trailing edge metal angles. Two design configurations that corresponded to SLTO and supersonic Mach number cruise operating conditions, and a third configuration geometrically midway between the two design configurations, were evaluated. Each of the three configurations were tested over a range of rotor speed and flow that encompassed both the SLTO and cruise design point conditions.

At the SLTO design conditions the SLTO configuration achieved a pressure ratio and adiabatic efficiency of 1.347 and 87.8%, respectively, compared to predicted values of 1.32 and 85.1%. At cruise design conditions the cruise configuration achieved a pressure ratio and efficiency of 1.15 and 90%, compared to predicted values of 1.129 and 88.3%. The efficiency of the SLTO configuration at cruise rotor speed and flow was 83%. In general, the cruise configuration permitted operation at lower flows and with correspondingly higher efficiencies than the SLTO configuration at the cruise rotor speed. Thus, the variable geometry features of the stage permitted efficient, stall-free operation over a wider range of corrected flow than that possible with the SLTO (fixed-geometry) configuration.

The Stator B configuration permitted adjustment of both the leading and trailing edge metal angles for operation at other than SLTO design conditions. This adjustment resulted in the desired match between rotor exit and stator inlet, and stator exit and hypothetical 2nd-stage rotor inlet conditions at the cruise design point. However, for the cruise setting the stator minimum losses at all span locations were significantly higher than those predicted for a conventional stator designed with the same air turning requirement. The high losses resulted from the generation of a broad wake that was considered to be the product of mixed wakes from the two airfoil segments of Stator B. Although the Stator B rear airfoil segment leading edge was designed to operate with low losses over a wide range of incidence angle (Reference 1), it is apparent that additional design criteria, pertinent to tandem airfoil design, are necessary to define a low-loss Stator B type configuration.

## REFERENCES


1. "Single Stage Experimental Evaluation of Variable Geometry Guide Vanes and Stators, Part I - Analysis and Design," NASA CR-54554, PWA FR-2112, August, 1968.

2. "Single Stage Experimental Evaluation of Variable Geometry Guide Vanes and Stators, Part II - Annular Cascade Investigation of Candidate Variable Geometry Designs," NASA CR-54555, PWA FR-2297, July, 1967.

3. "Single Stage Experimental Evaluation of Variable Geometry Guide Vanes and Stators, Part III - Data and Performance for Variable Camber Guide Vanes and Stator A," NASA CR-54556, PWA FR-2638, December 1968.

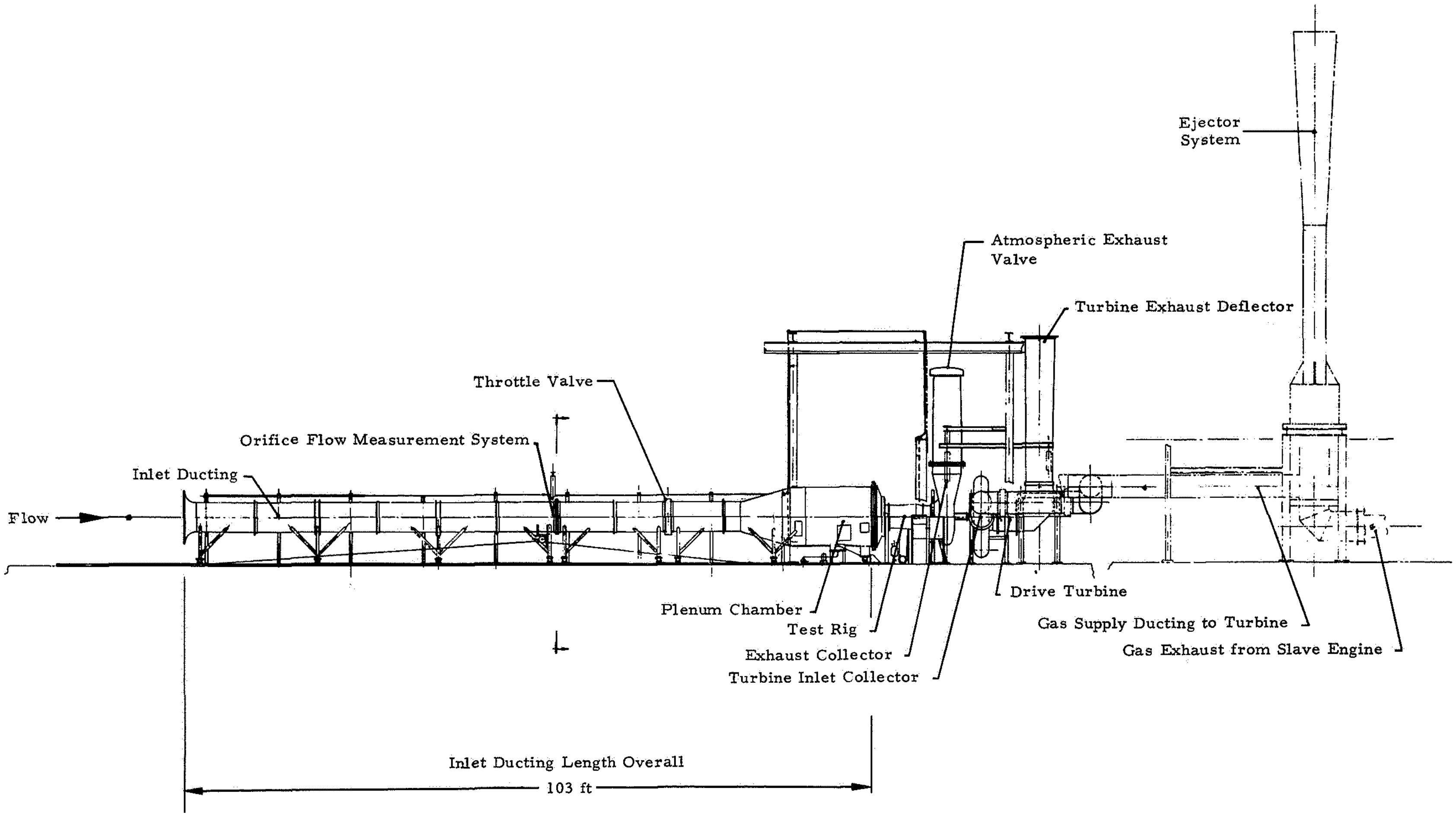



Figure 1. Compressor Research Facility

FD 10891D

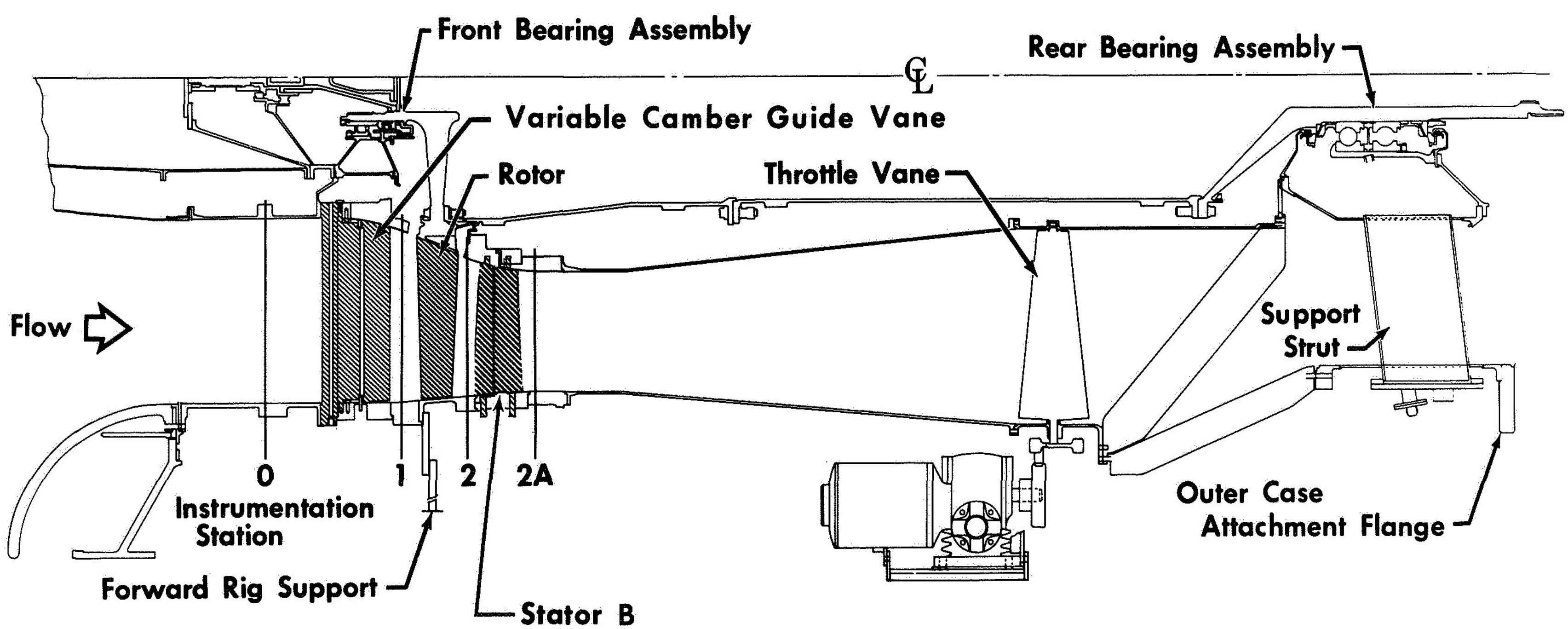



Figure 2. Compressor Rig

GS 2120D

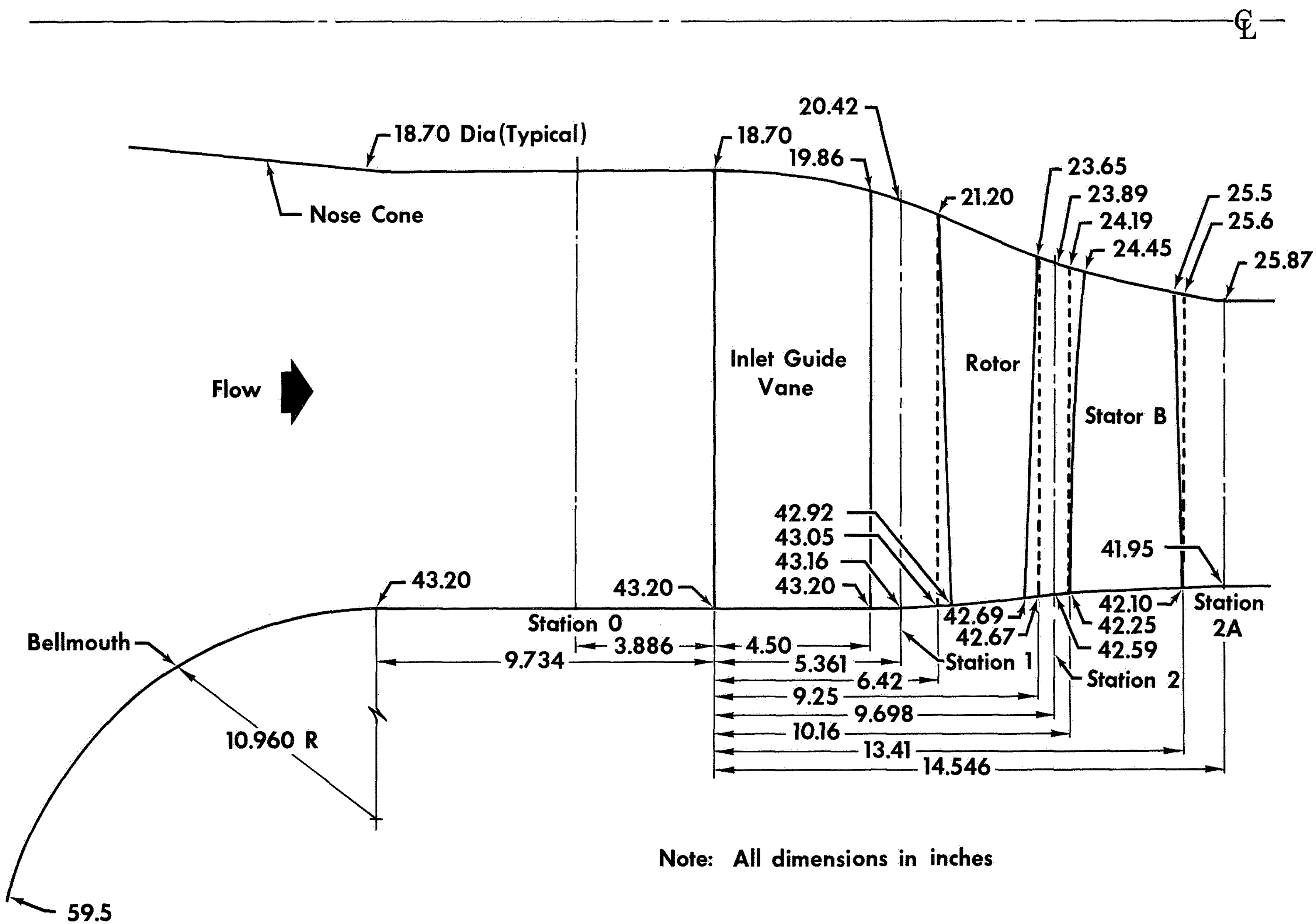



Figure 3. Section View of Flowpath

GS 6614A

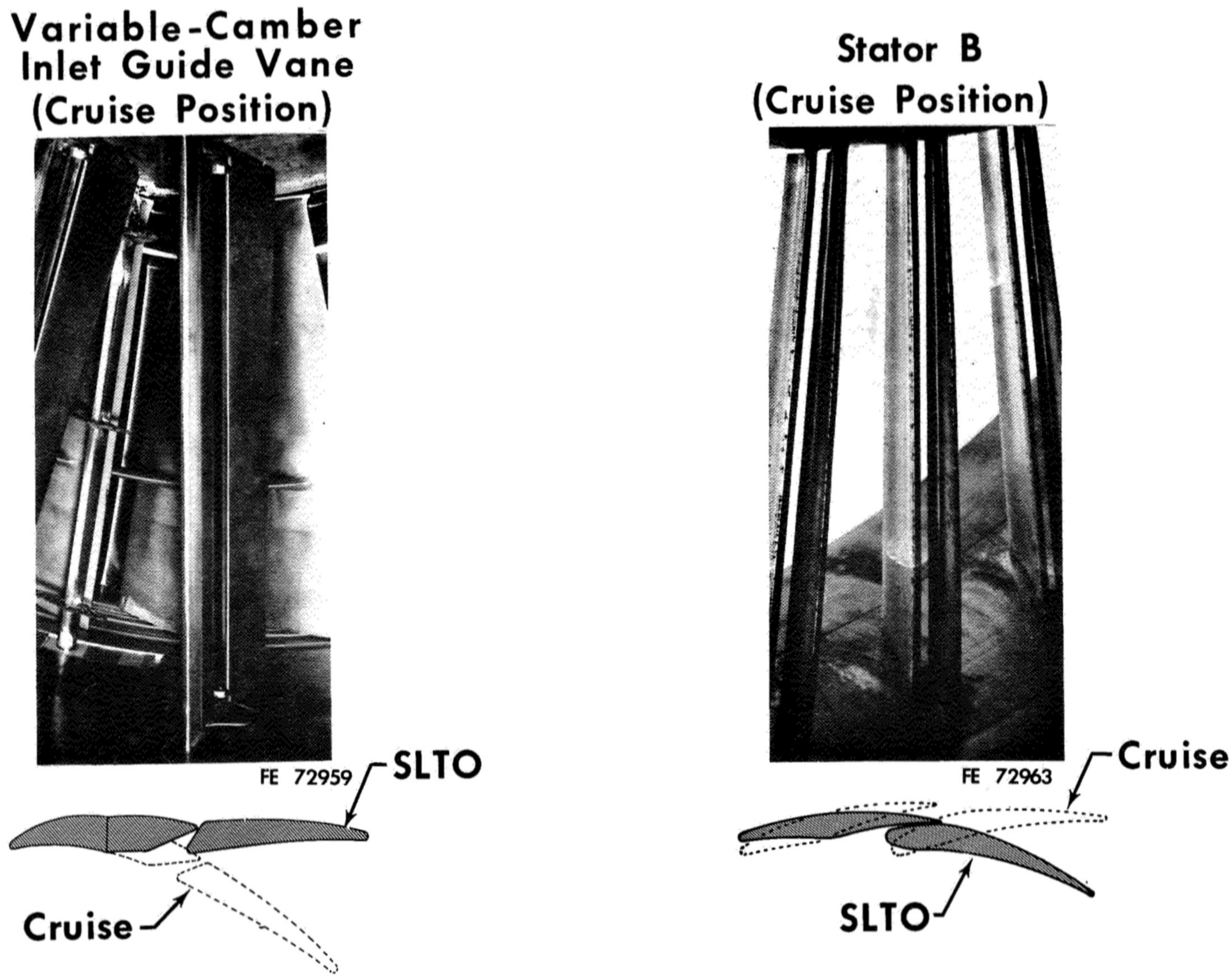



Figure 4. Variable Geometry Inlet Guide Vane and Stator B

GS 6613C

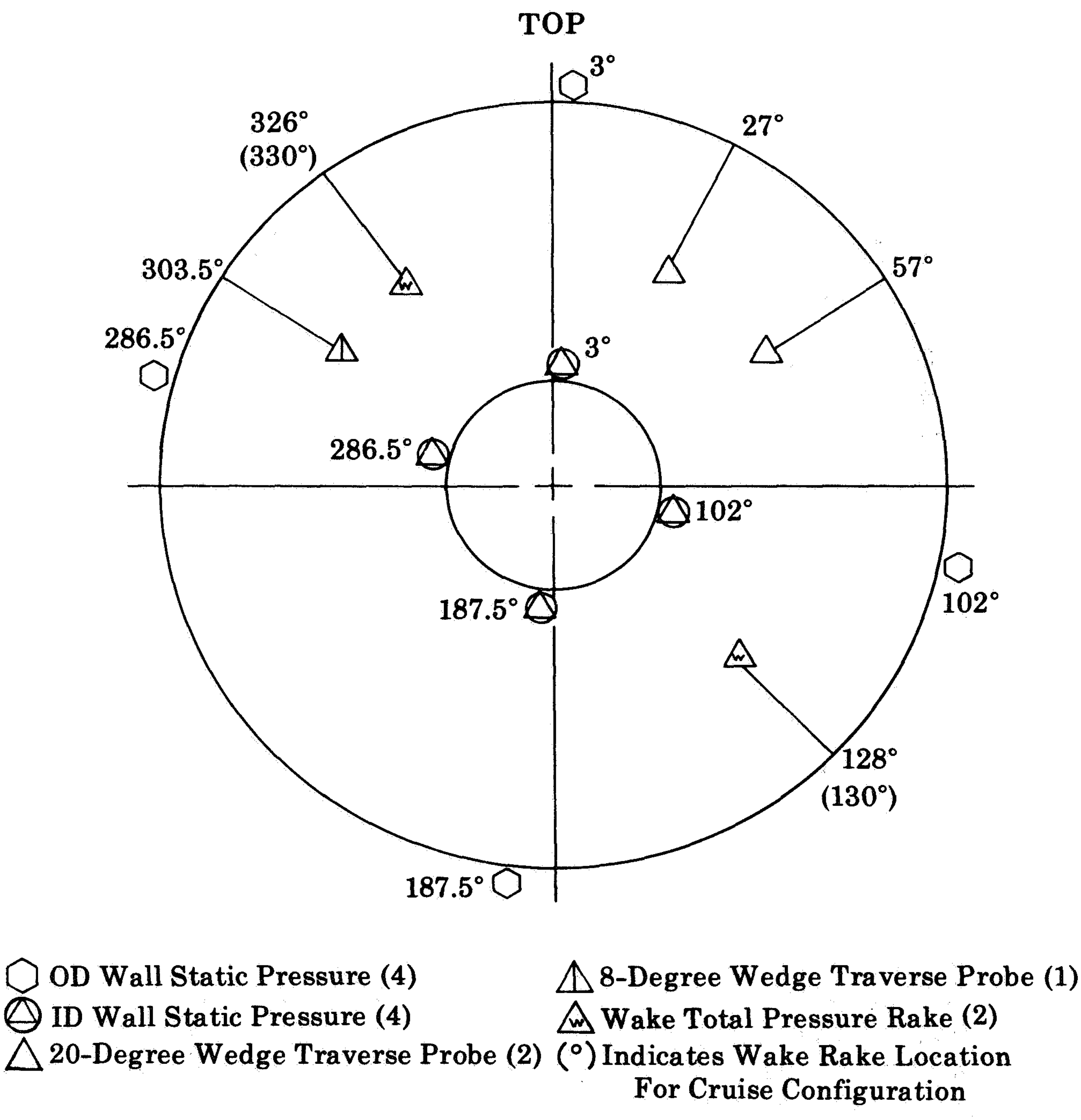



Figure 5. Instrumentation Station 1, View Looking Forward FD 25194

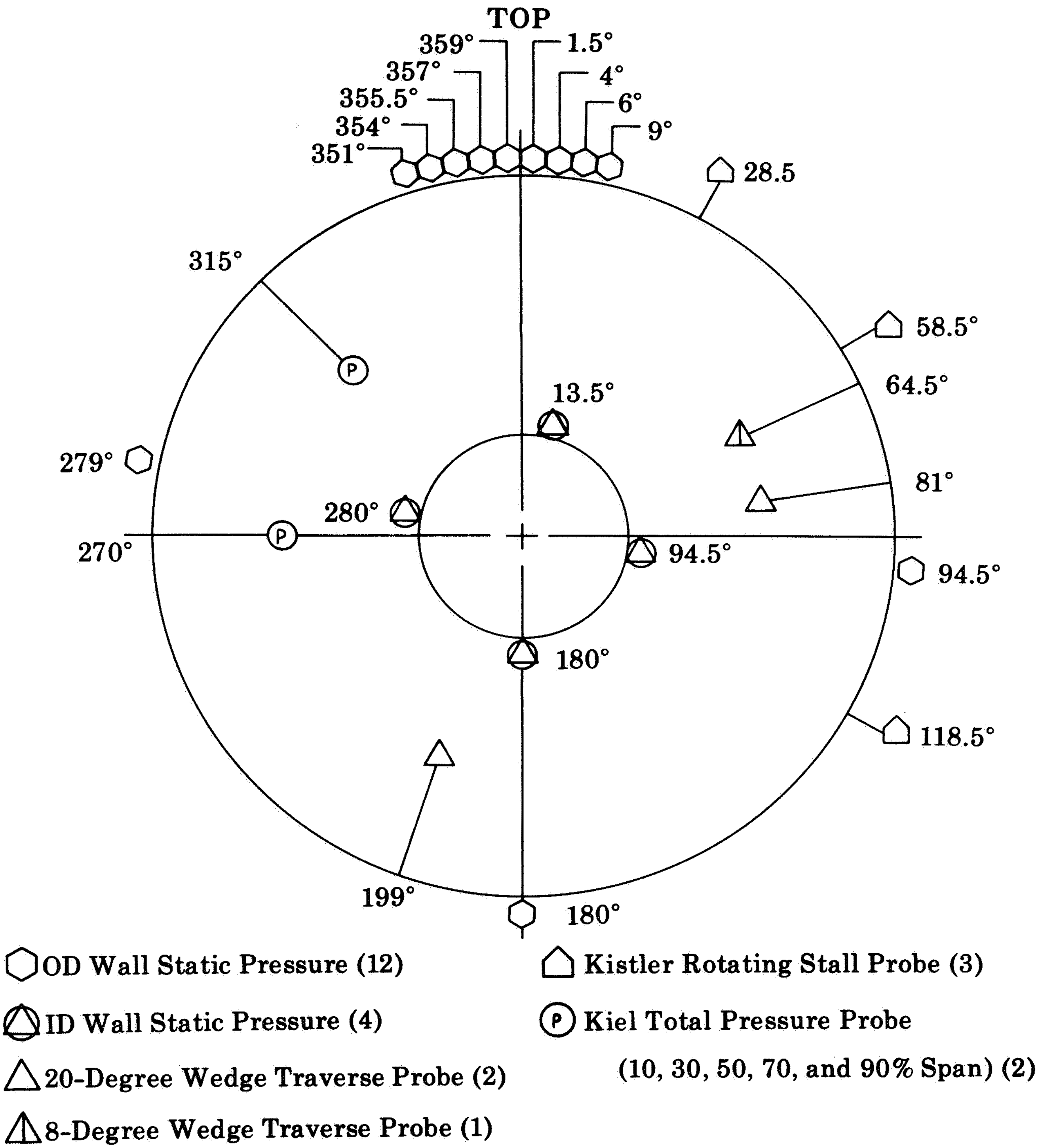
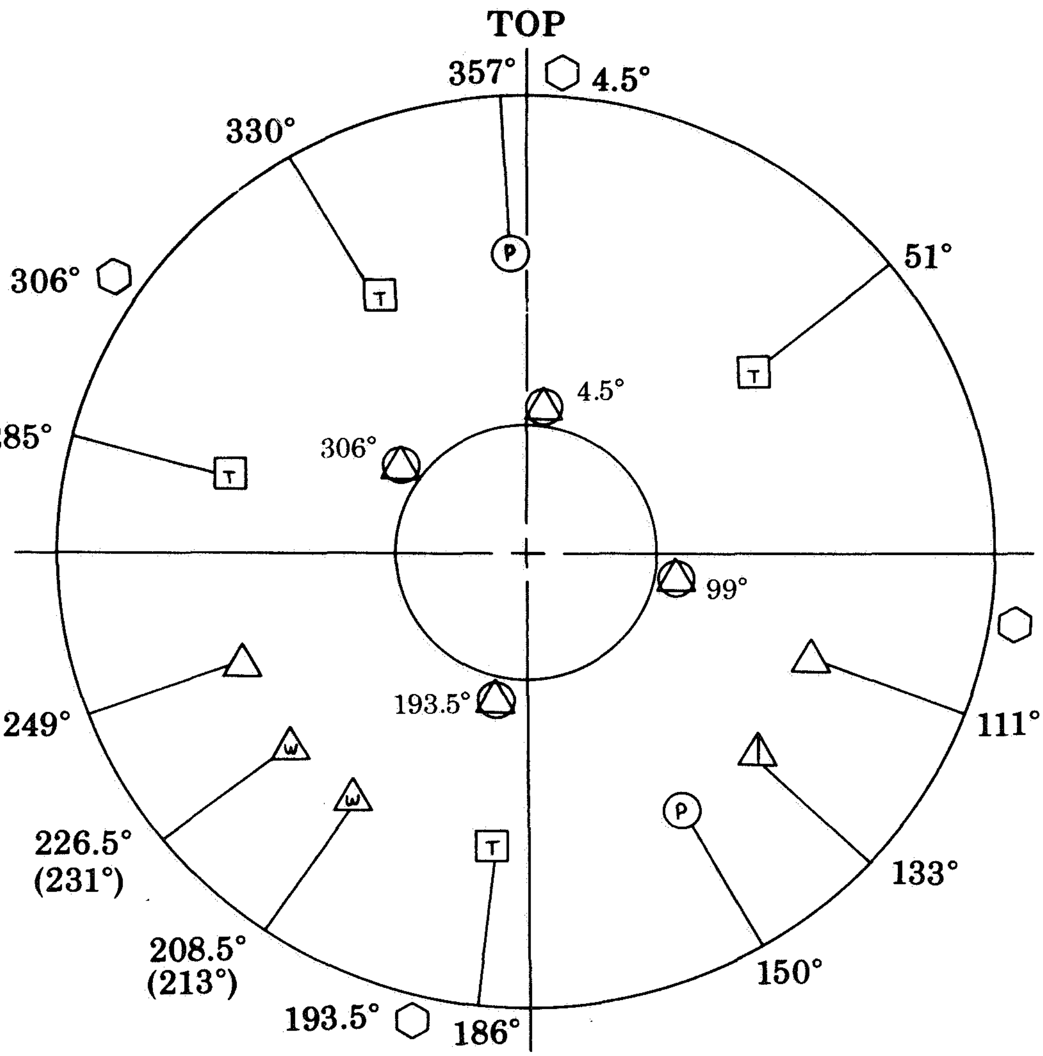


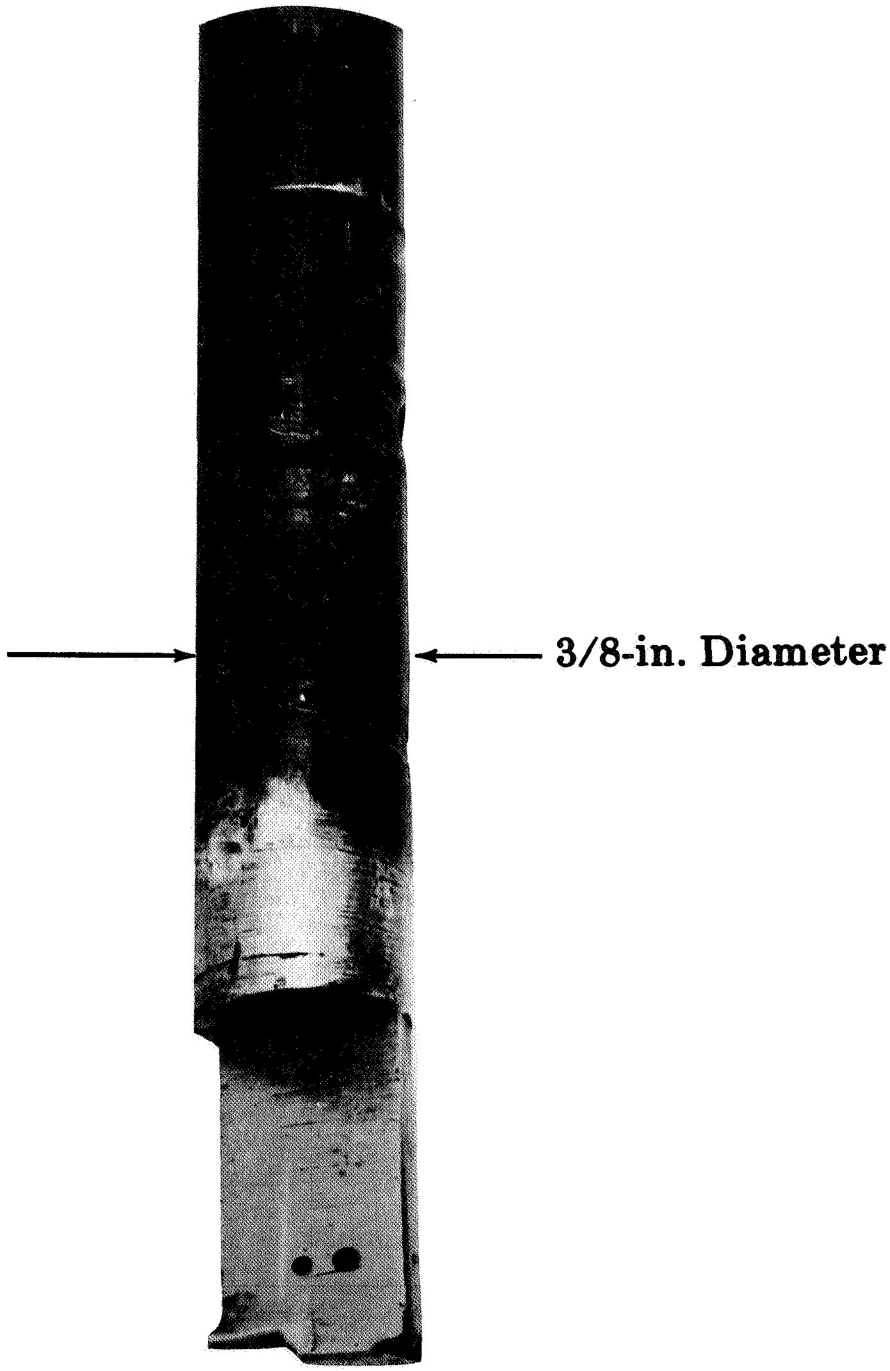

Figure 6. Instrumentation Station 2, View Looking Forward FD 25195




OD Wall Static Pressure (4)
ID Wall Static Pressuree(4)
20-Degree Wedge Probe (2)
8-Degree Wedge Traverse Probe (1)
Wake Total Pressure Rake (2)
(°) Indicates Wake Rake Location For Cruise Configuration

T Temperature Rake (10, 30, 50, 70 and 90% Span) (4)
P Kiel Total Pressure Probe (10, 30, 50, 70 and 90% Span ) (2)

Figure 7. Instrumentation Station 2A, View Looking Forward FD 25196




FE 73903

Figure 8. 20-Degree Wedge Probe FD 25197

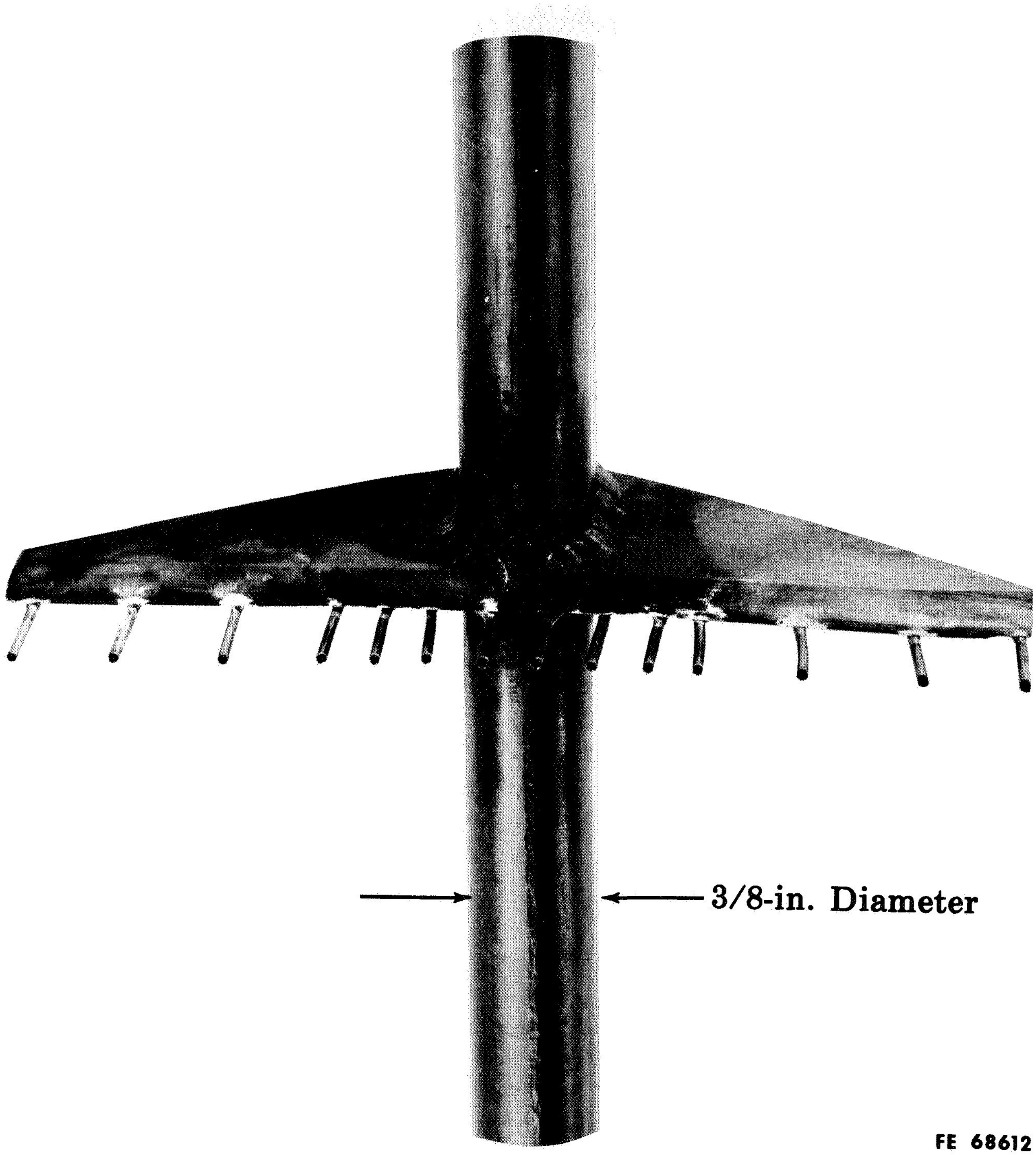



Figure 9. Typical Wake Probe Rake FD 25198

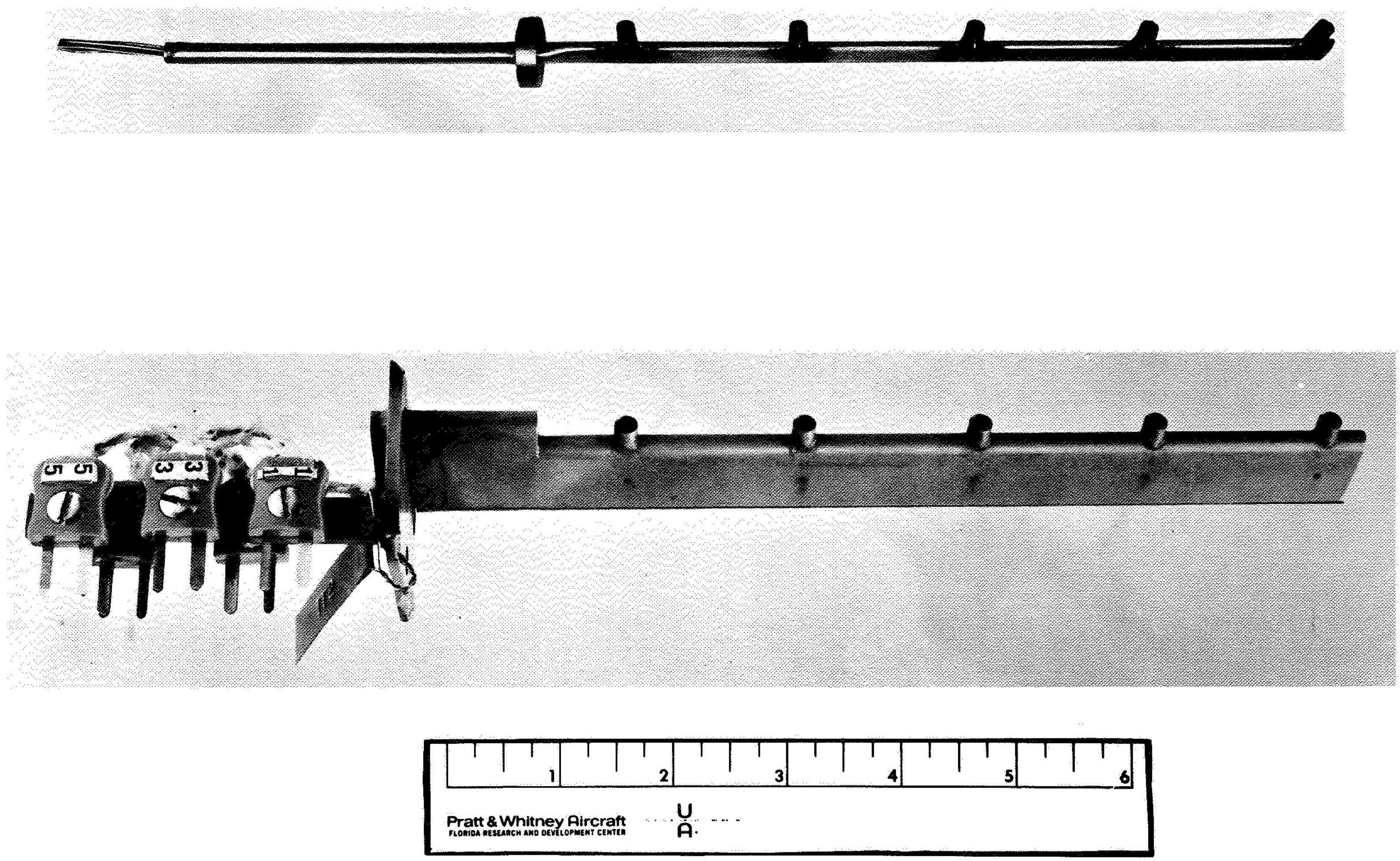



Figure 10. Total Temperature and Total Pressure Rakes

FE 80200

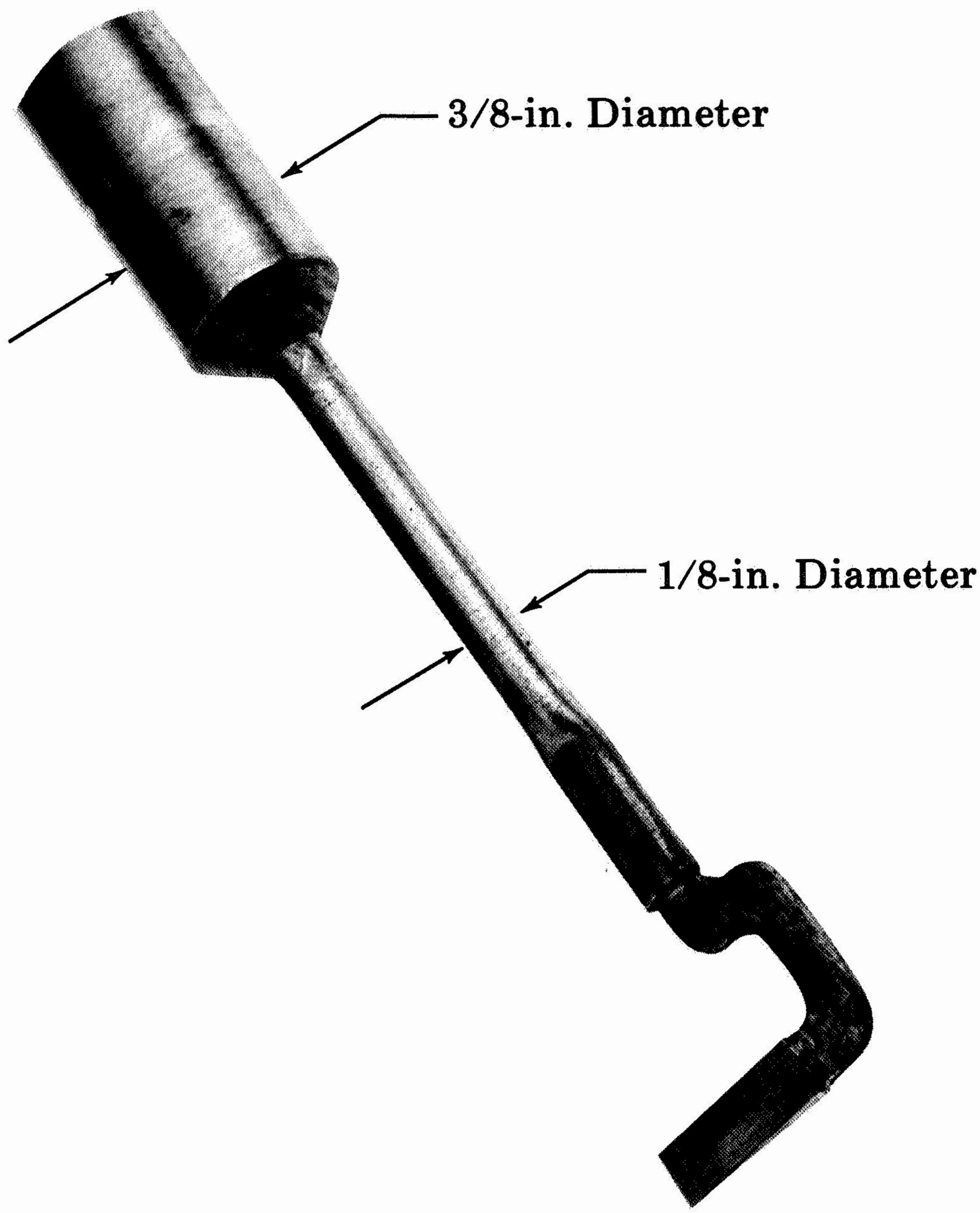
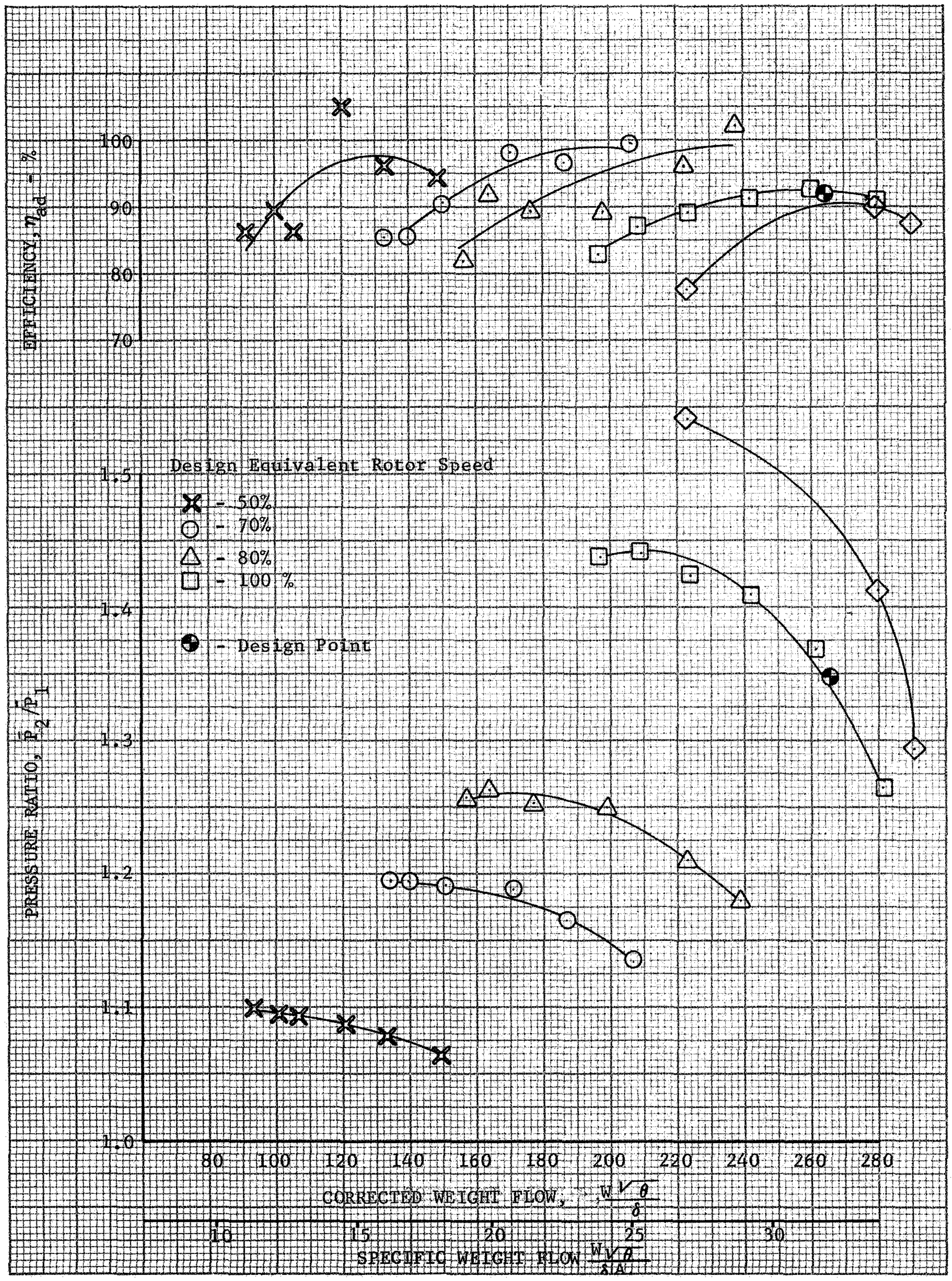
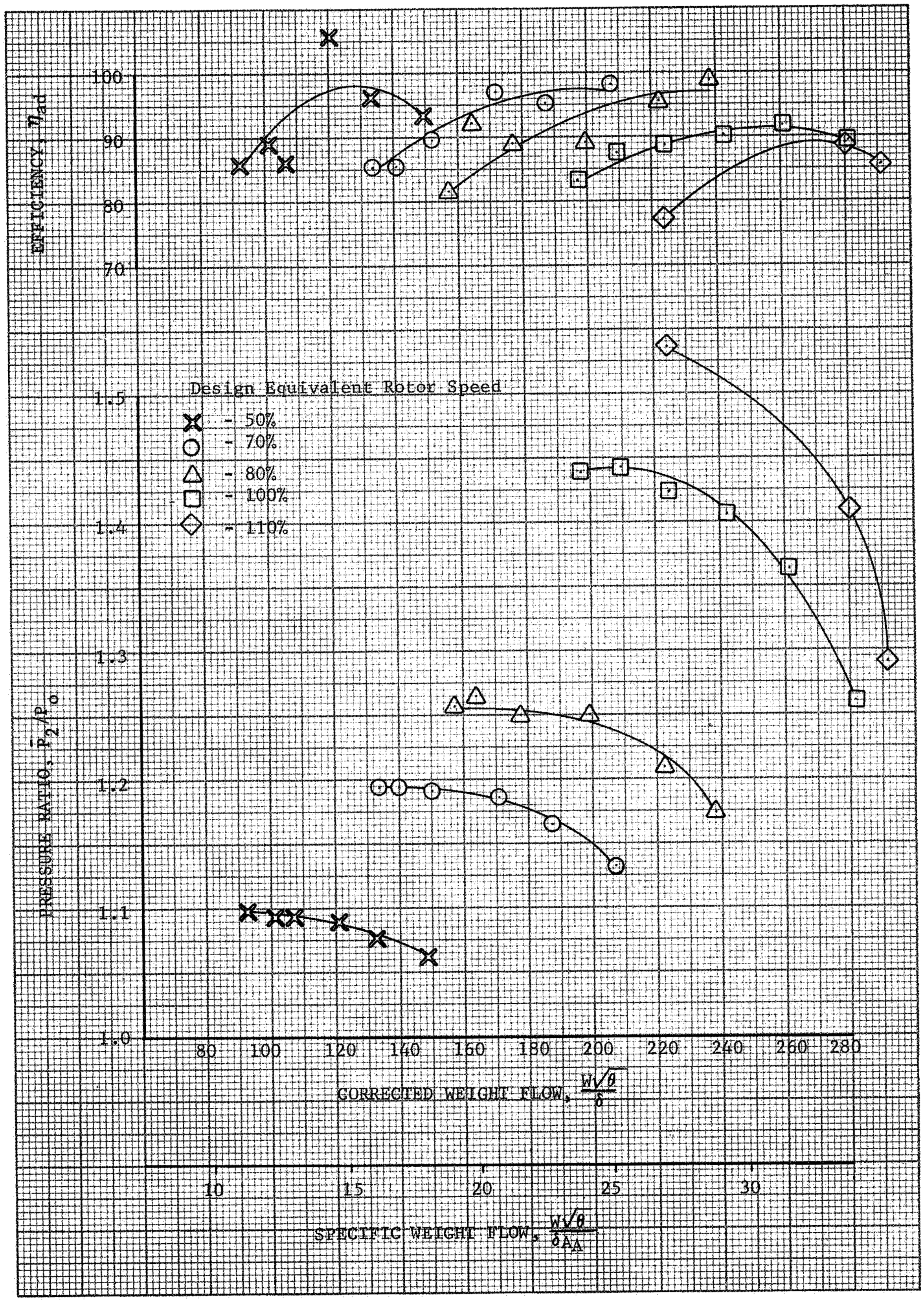



Figure 11. 8-Degree Wedge Probe FD 25200



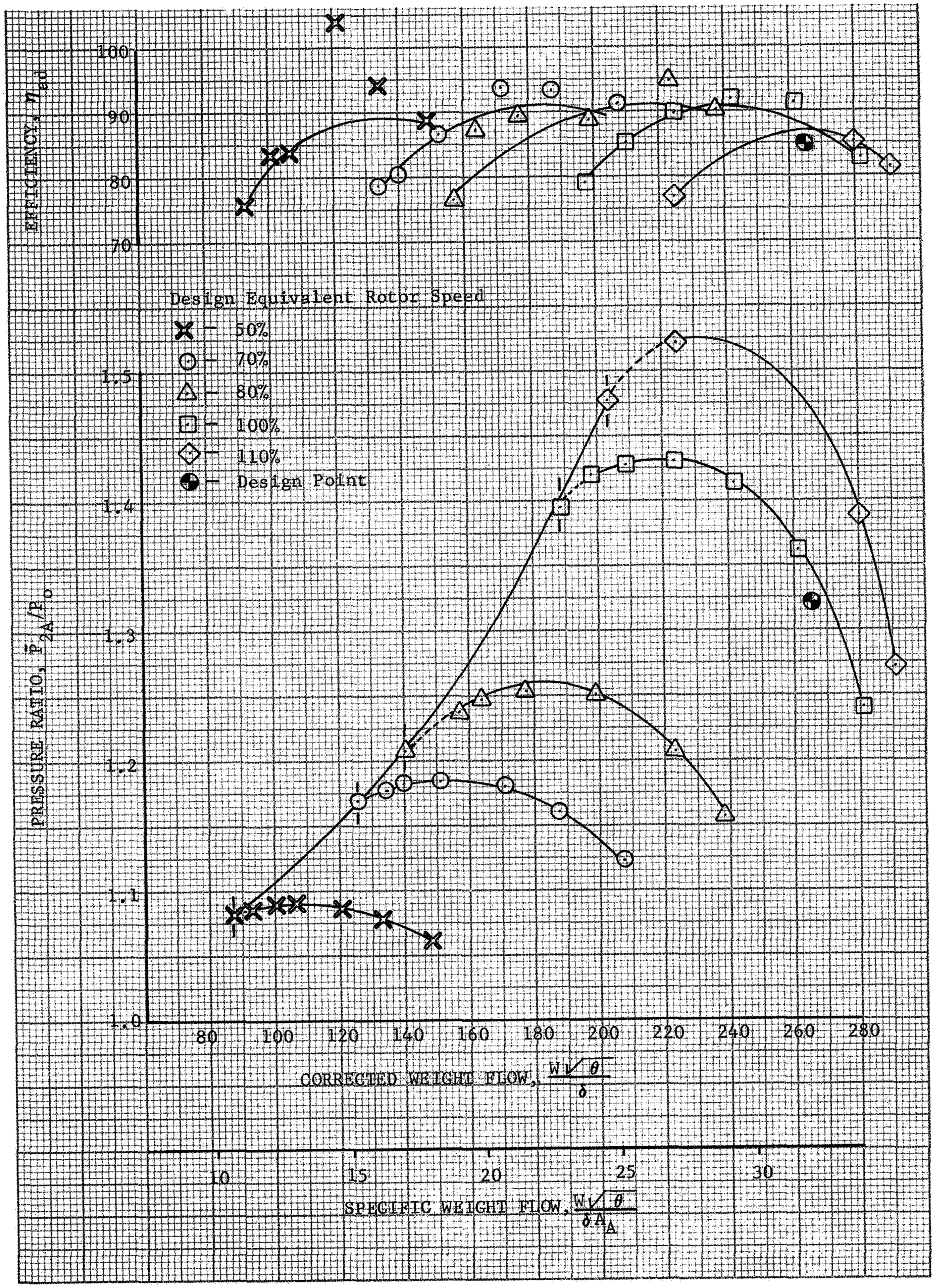

DF 68753

Figure 12. Overall Performance:
Rotor Only, SLTO Configuration



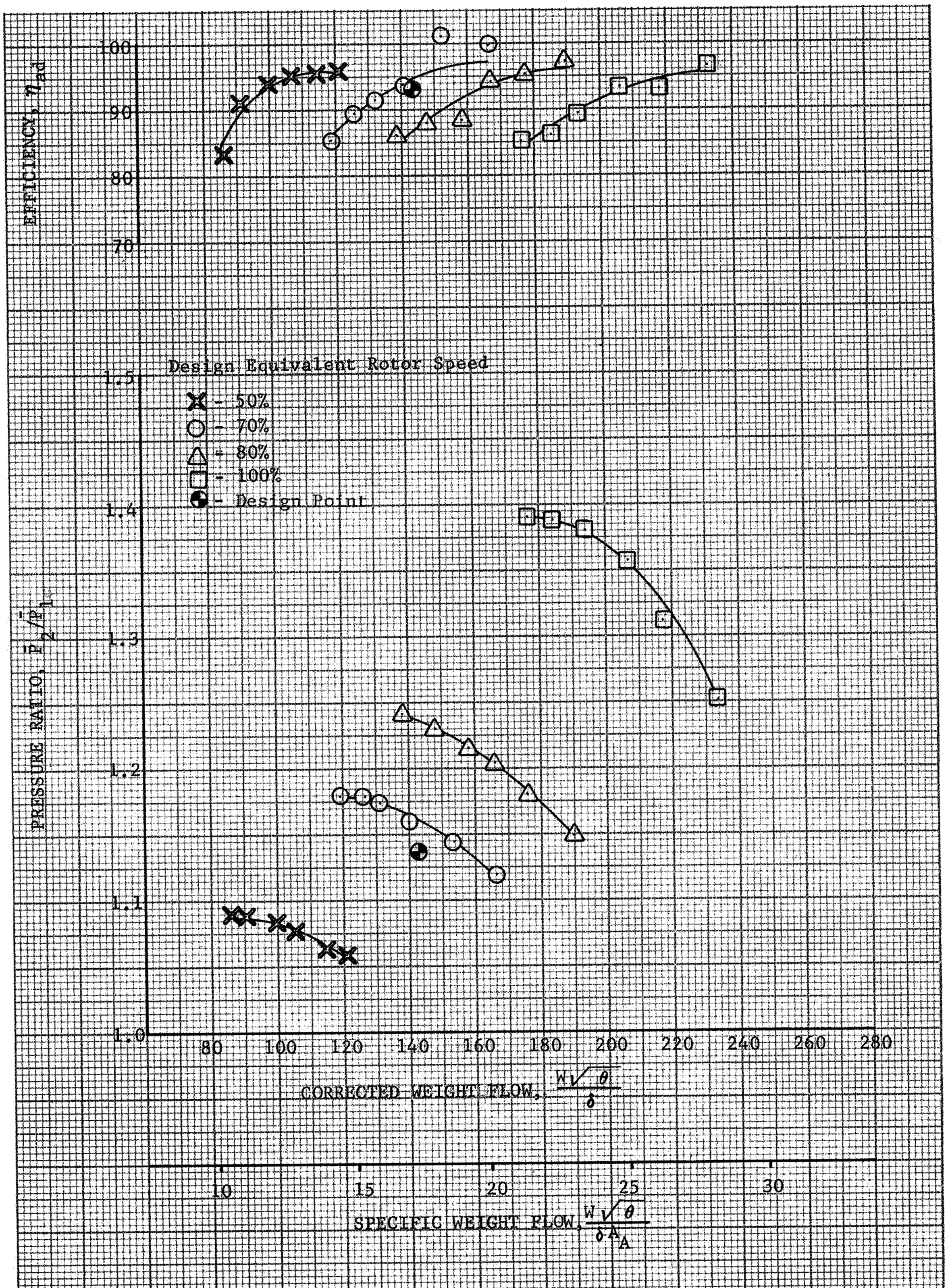

DF 68754

Figure 13. Overall Performance: Guide Vane Rotor, SLTO Configuration




DF 68755

Figure 14. Overall Performance: Guide Vane, Rotor, Stator B, SLTO Configuration




DF 68756

Figure 15. Overall Performance:
Rotor Only, Cruise Configuration

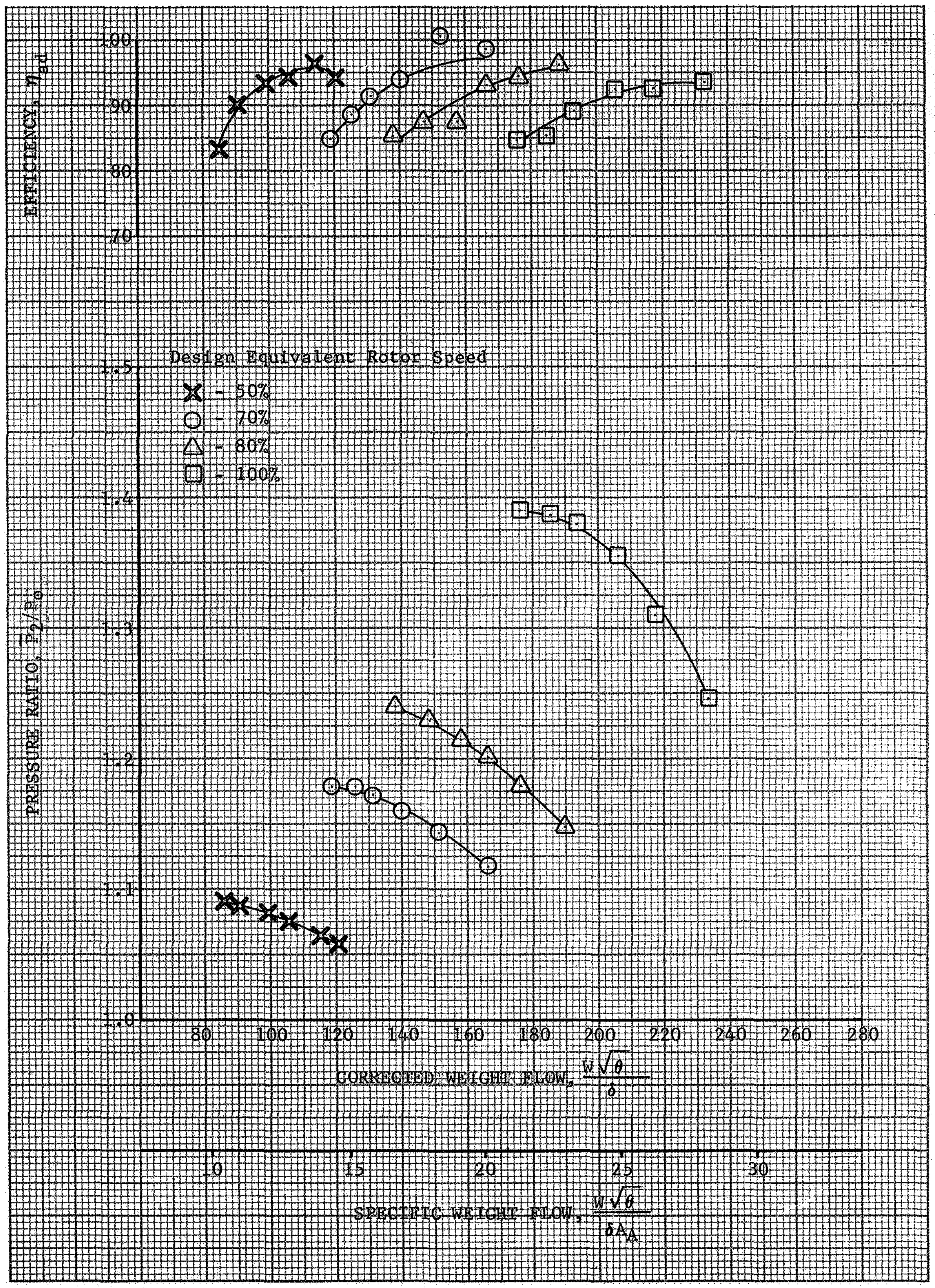


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Figure 16. Overall Performance: Guide Vane, Rotor, Cruise Configuration

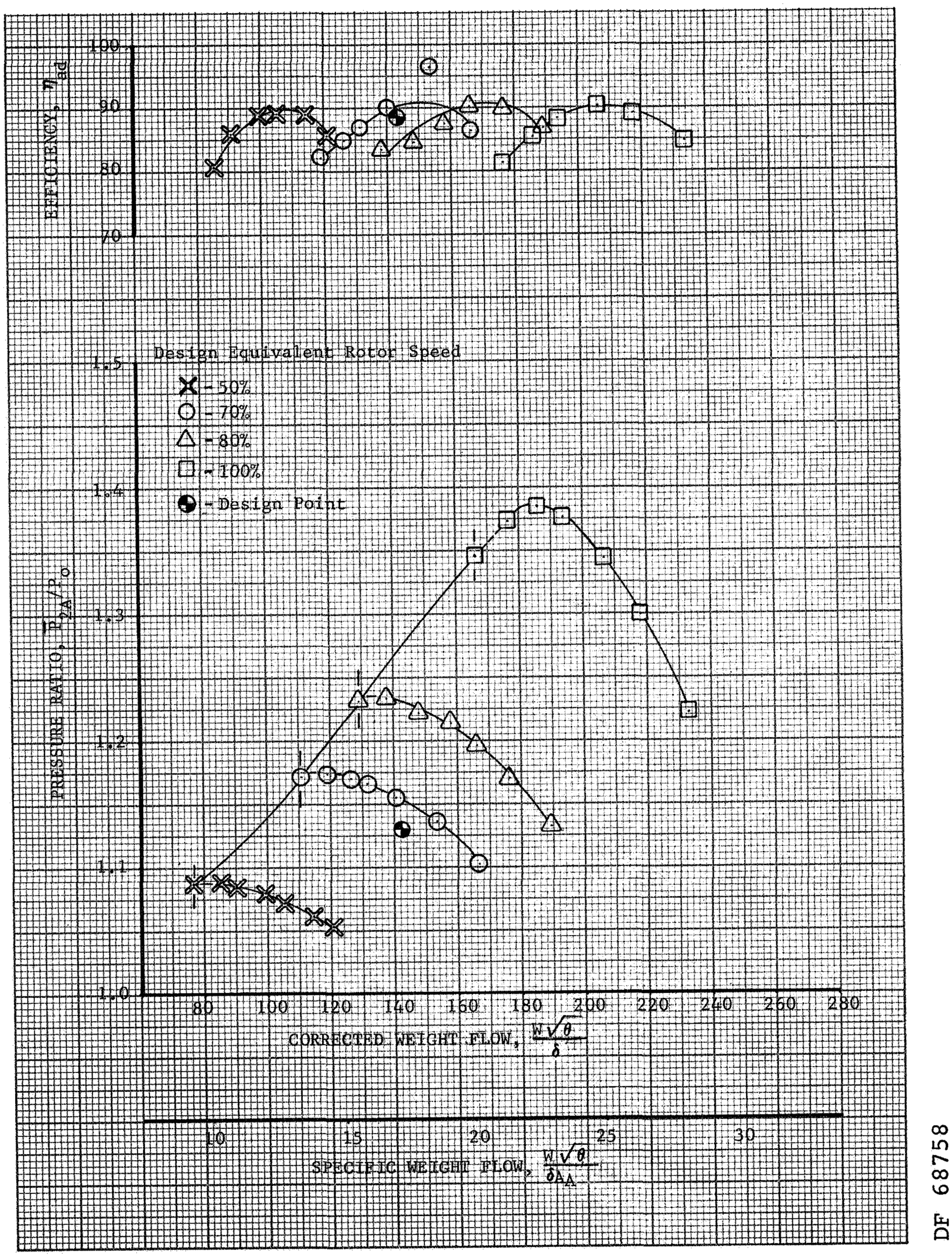


Figure 17. Overall Performance: Guide Vane, Rotor, Stator B, Cruise Configuration

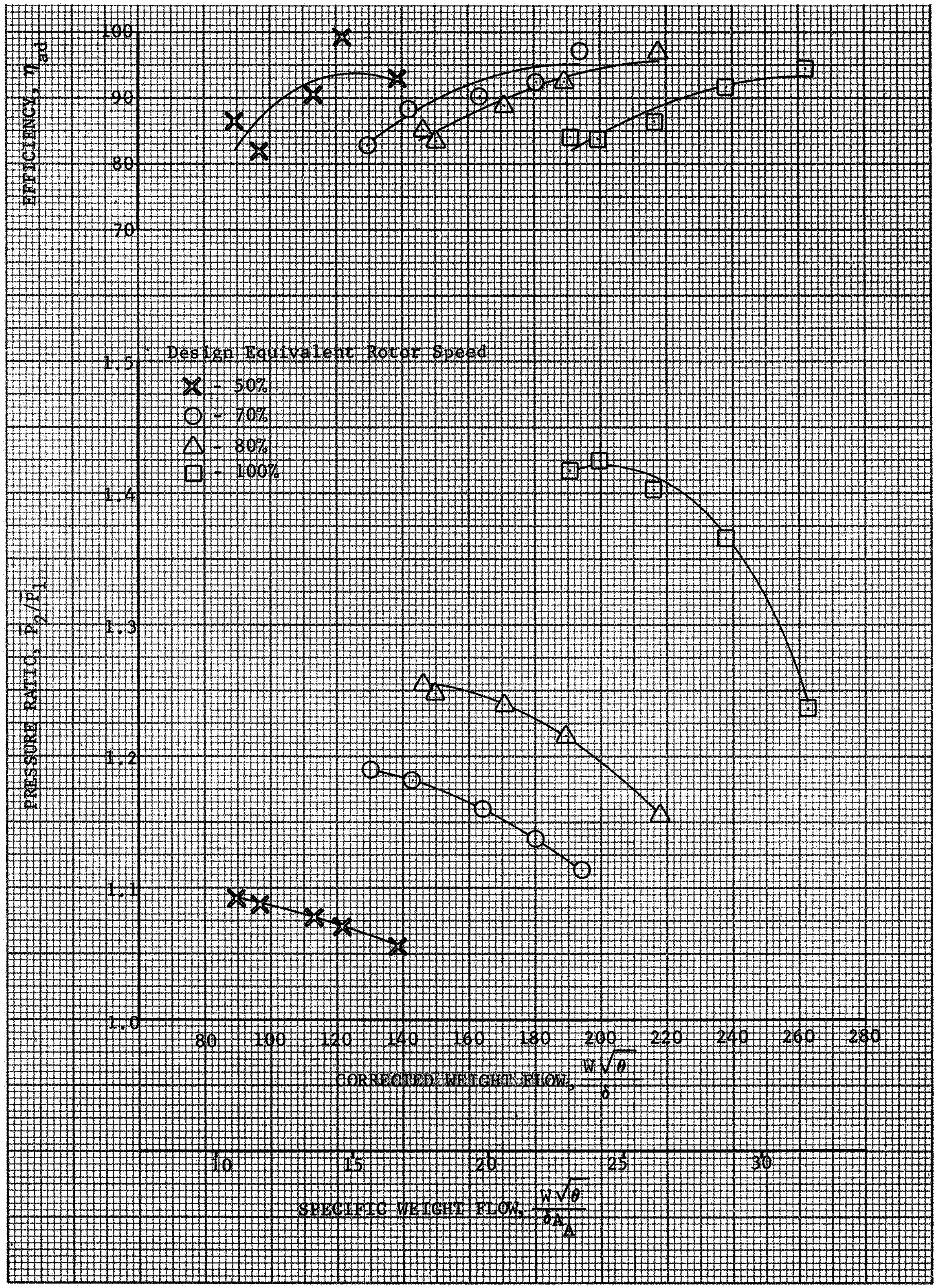


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Figure 18. Overall Performance:
Rotor Only, Intermediate Configuration

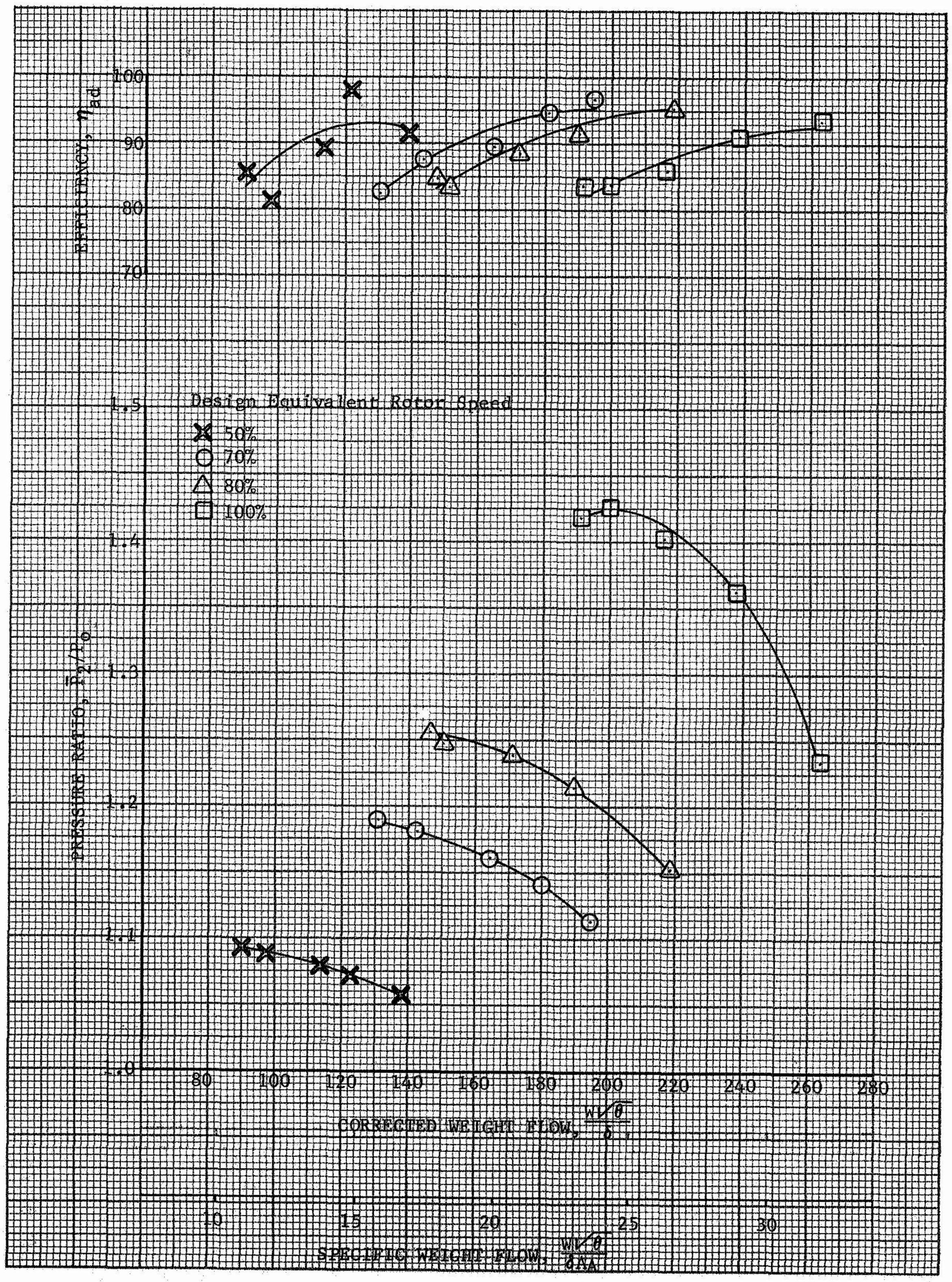


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Figure 19. Overall Performance: Guide Vane, Rotor, Intermediate Configuration

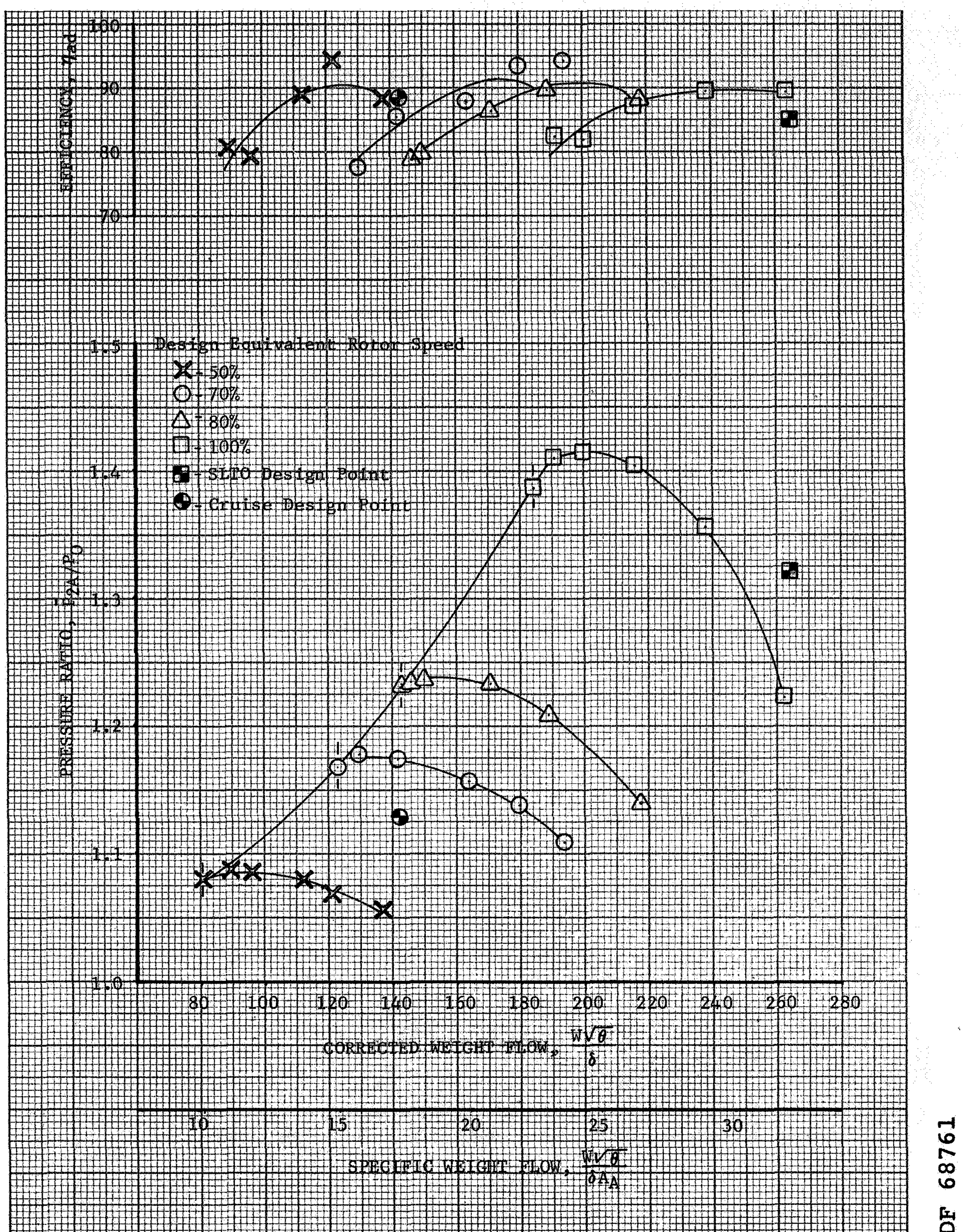


Figure 20. Overall Performance: Guide Vane, Rotor, Stator B, Intermediate Configuration

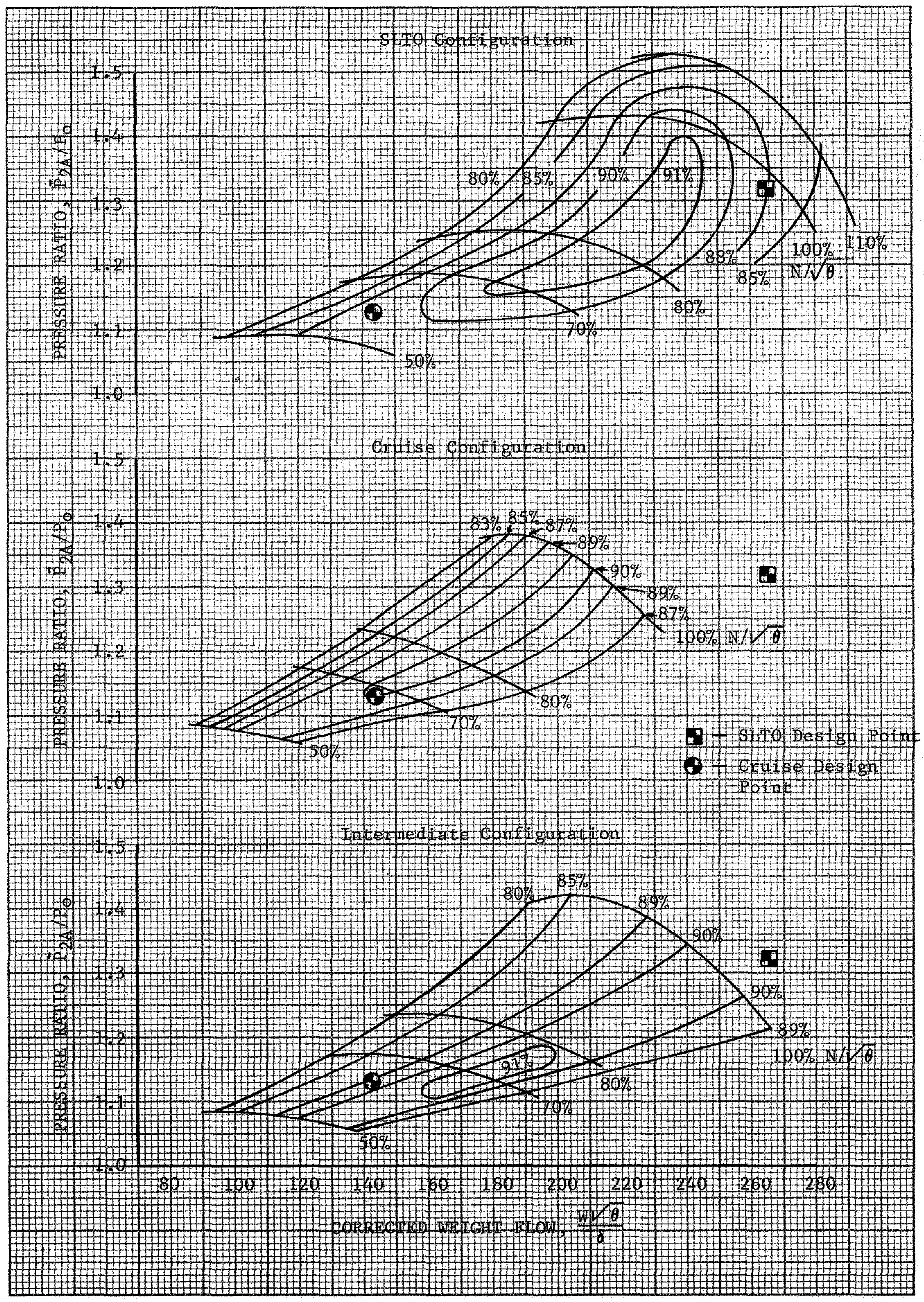


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Figure 21. Stage Efficiency Contours

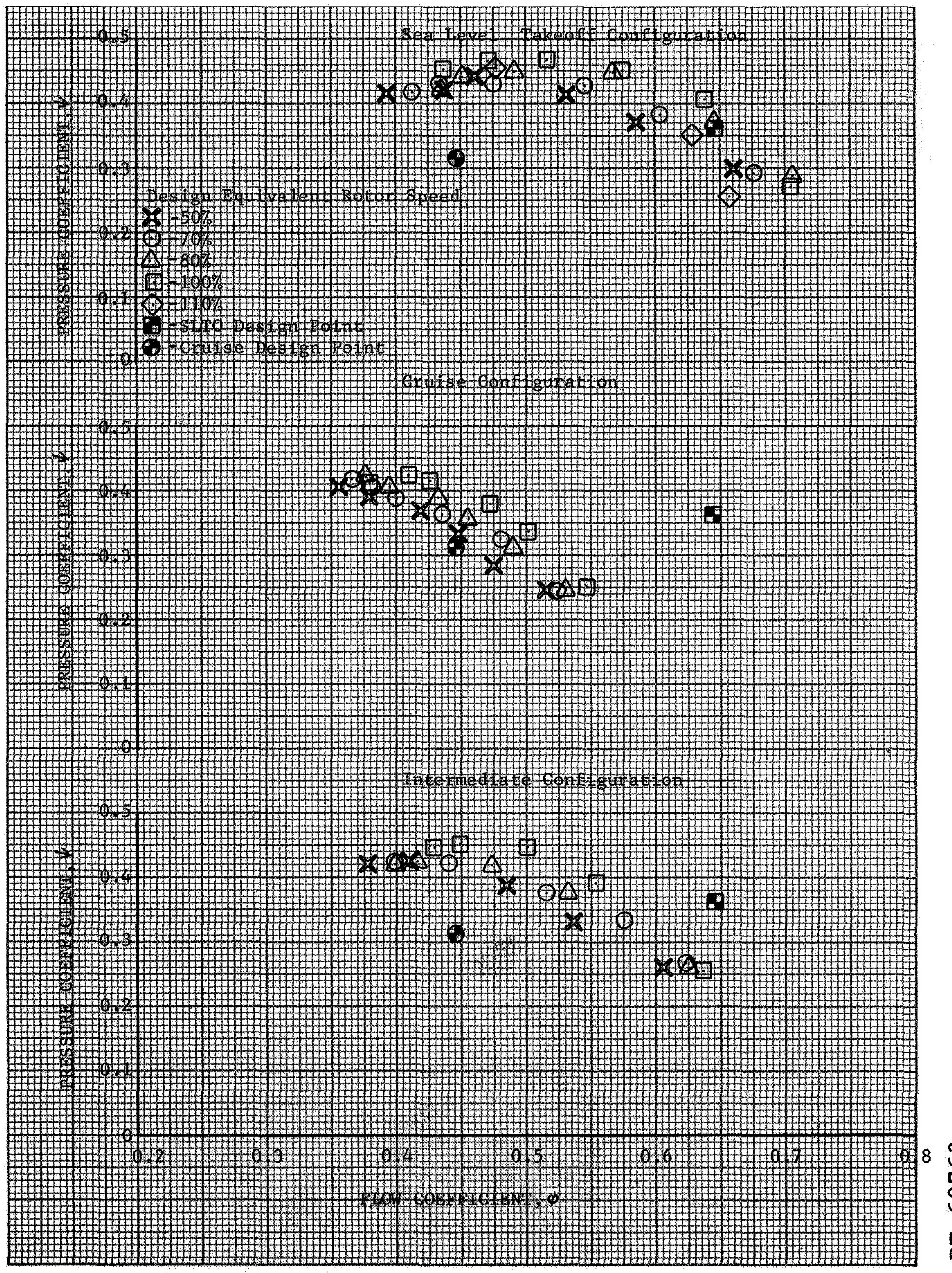


Figure 22. Pressure Rise Coefficient vs Flow Coefficient

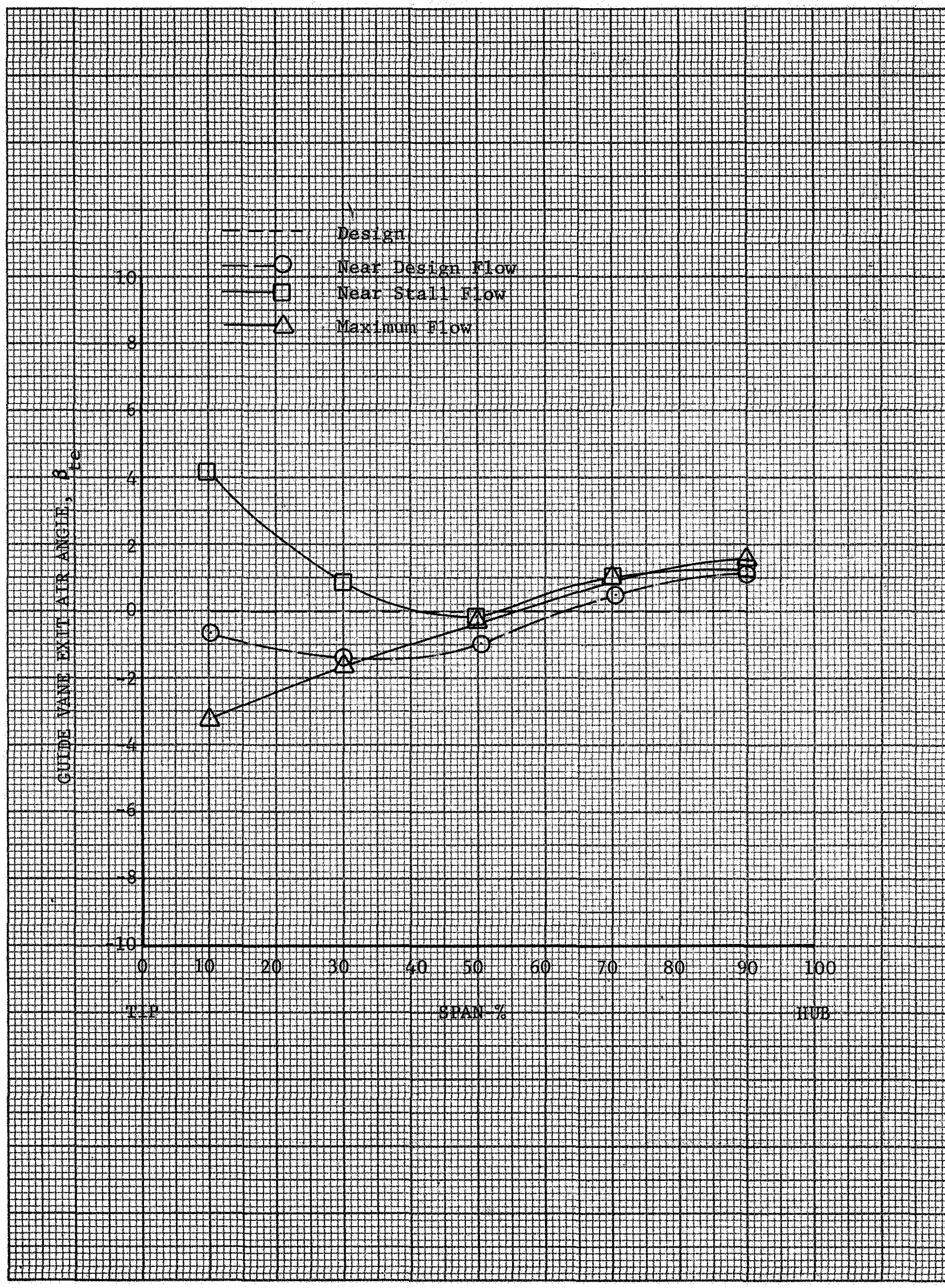


Figure 23. Guide Vane Exit Air Angle: SLTO Configuration,100% Equivalent Rotor Speed

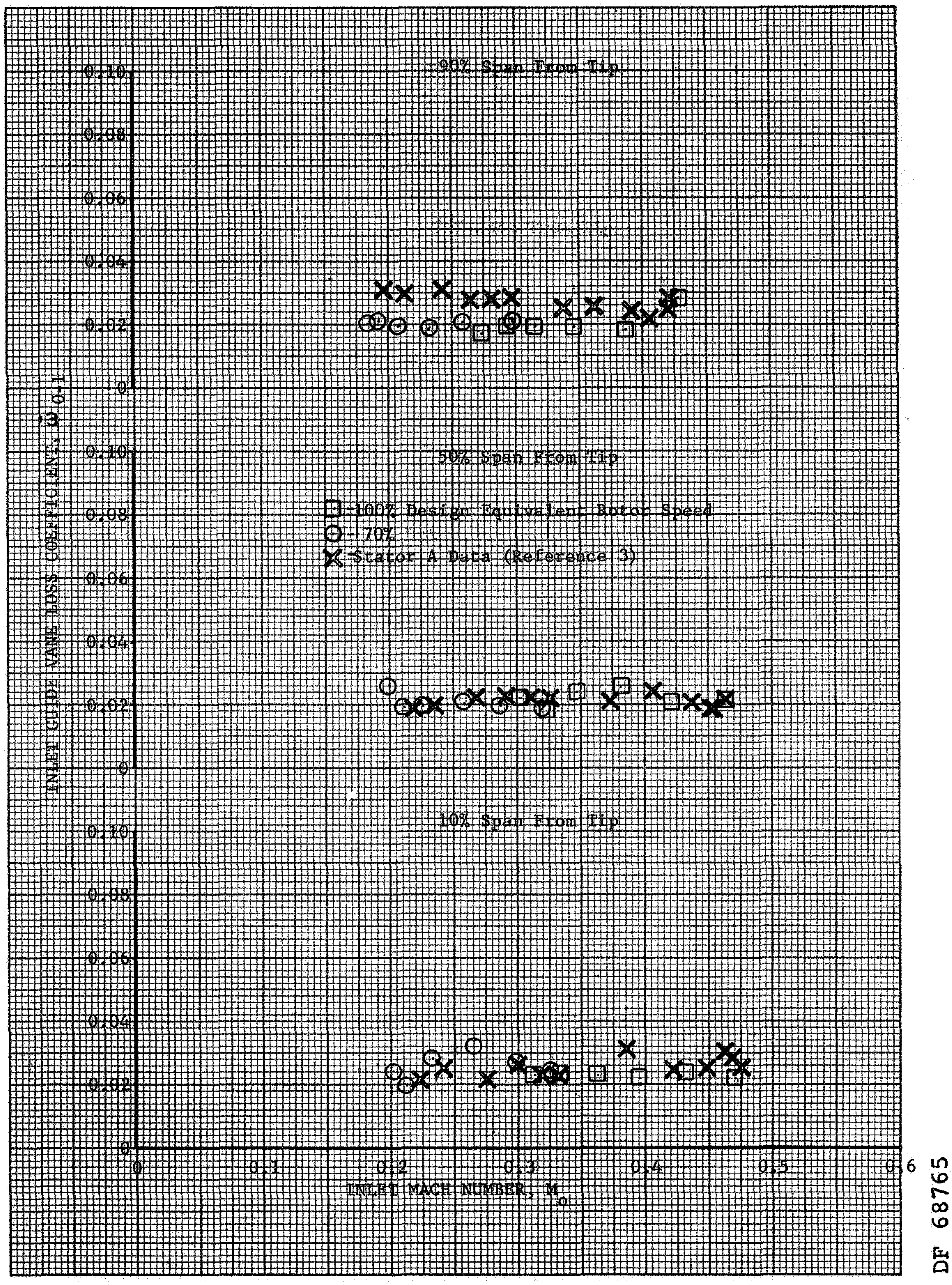


Figure 24. Inlet Guide Vane Loss Coefficient vs Inlet Mach Number: SLTO Configuration

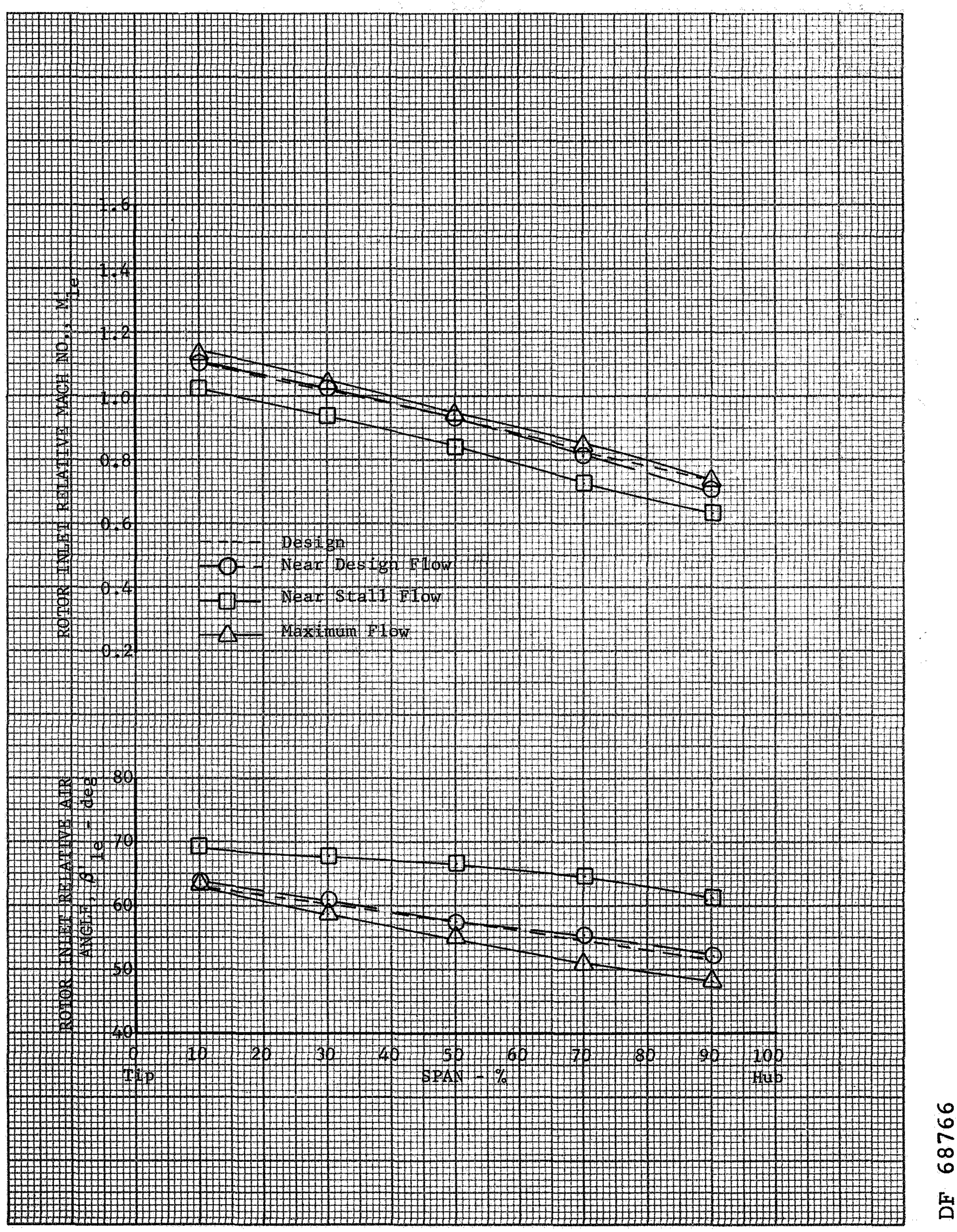


Figure 25. Rotor Inlet Air Angle and Mach Number Distribution: SLTO Configuration, 100% Equivalent Rotor Speed

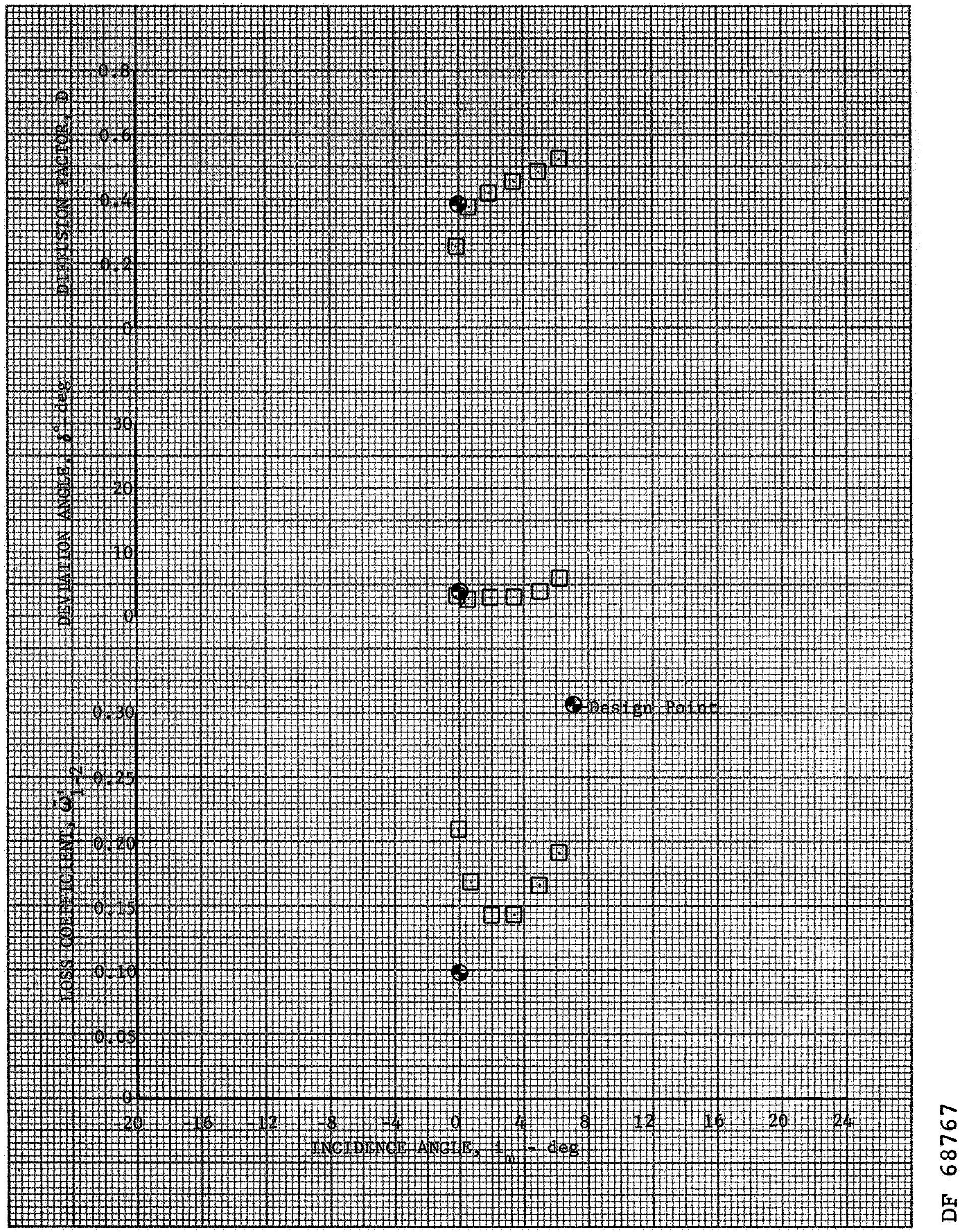


Figure 26. Rotor Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 10% Span From Tip

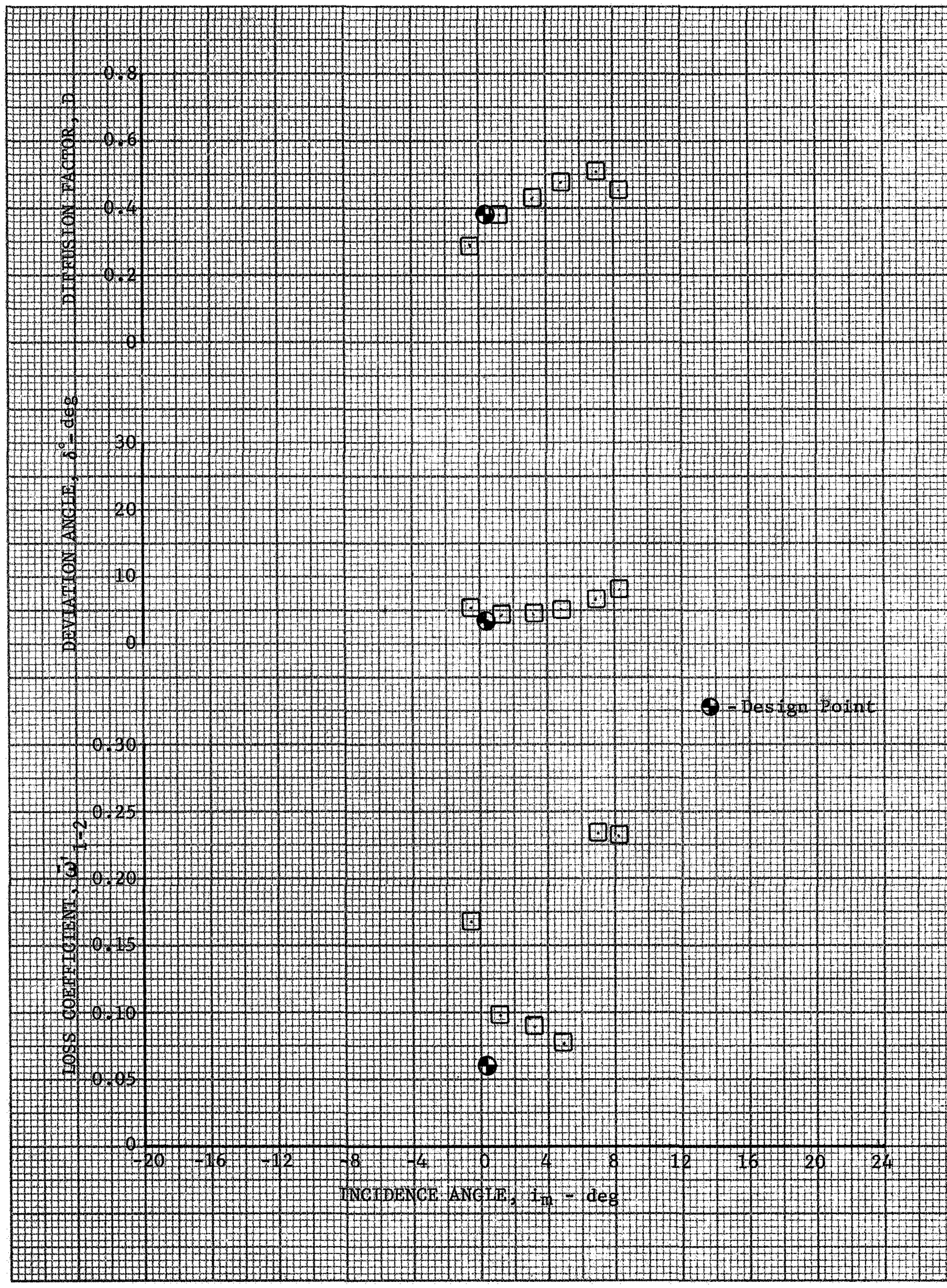


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Figure 27. Rotor Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 30% Span From Tip

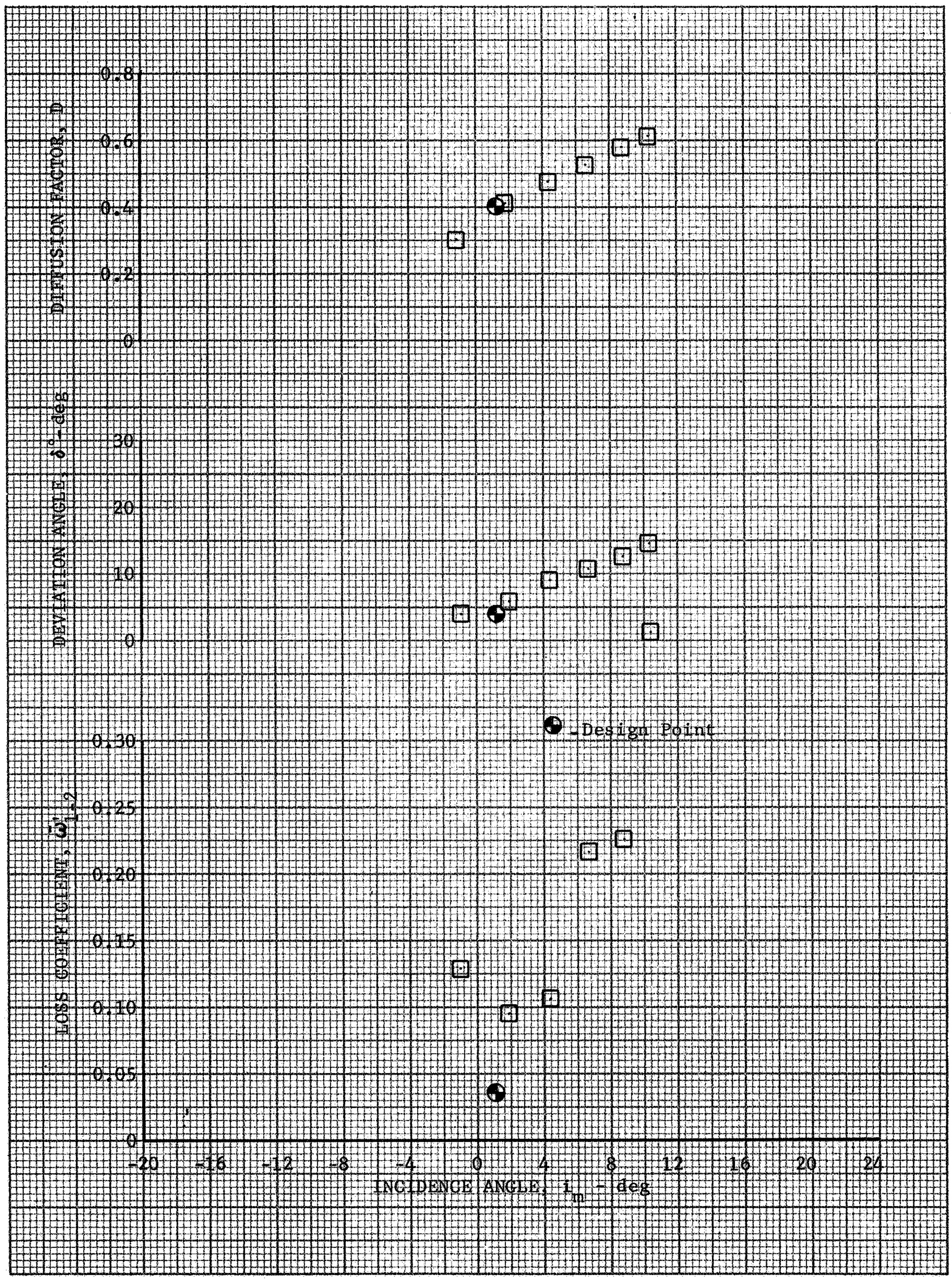


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Figure 28. Rotor Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 50% Span From Tip

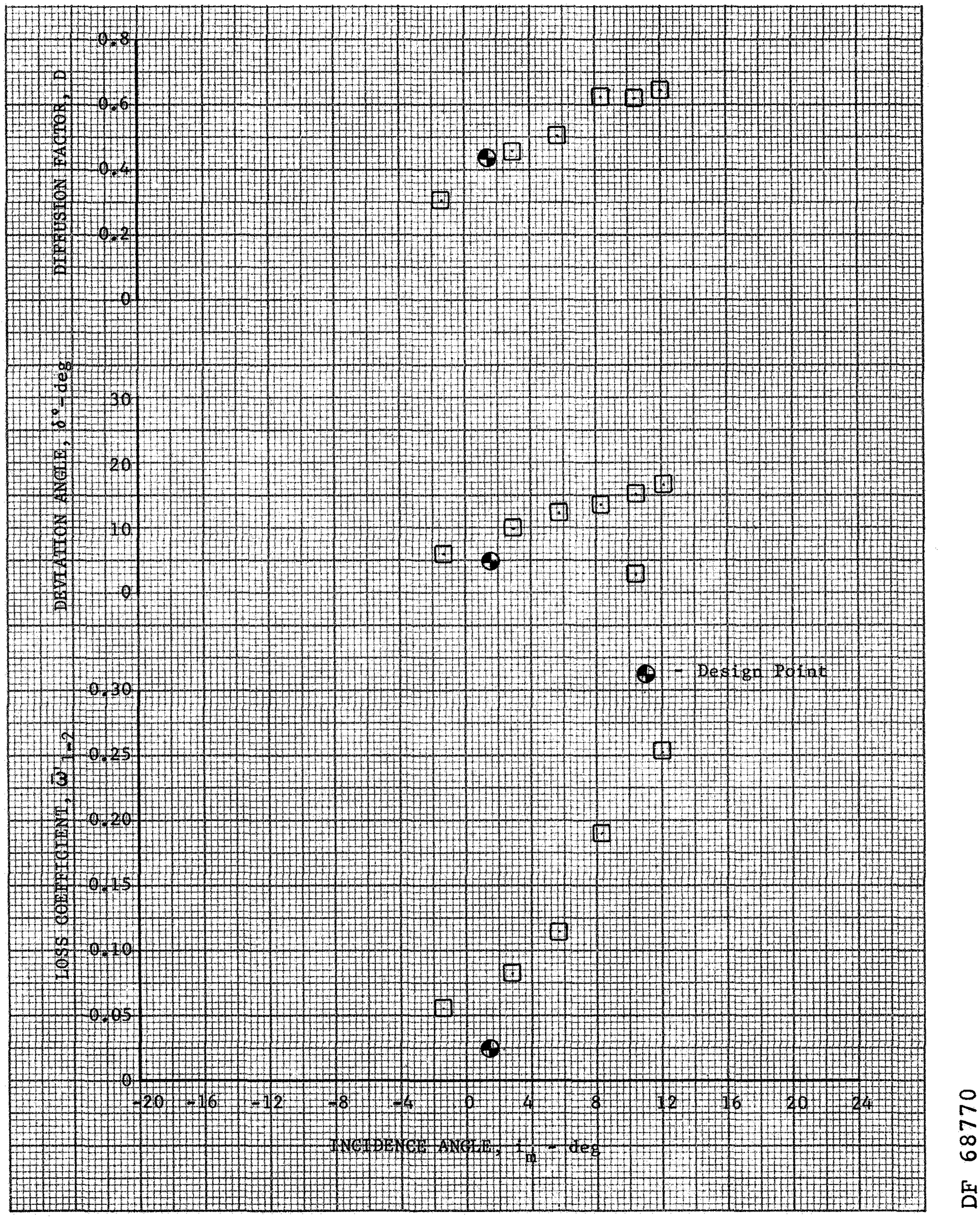


Figure 29. Rotor Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 70% Span From Tip

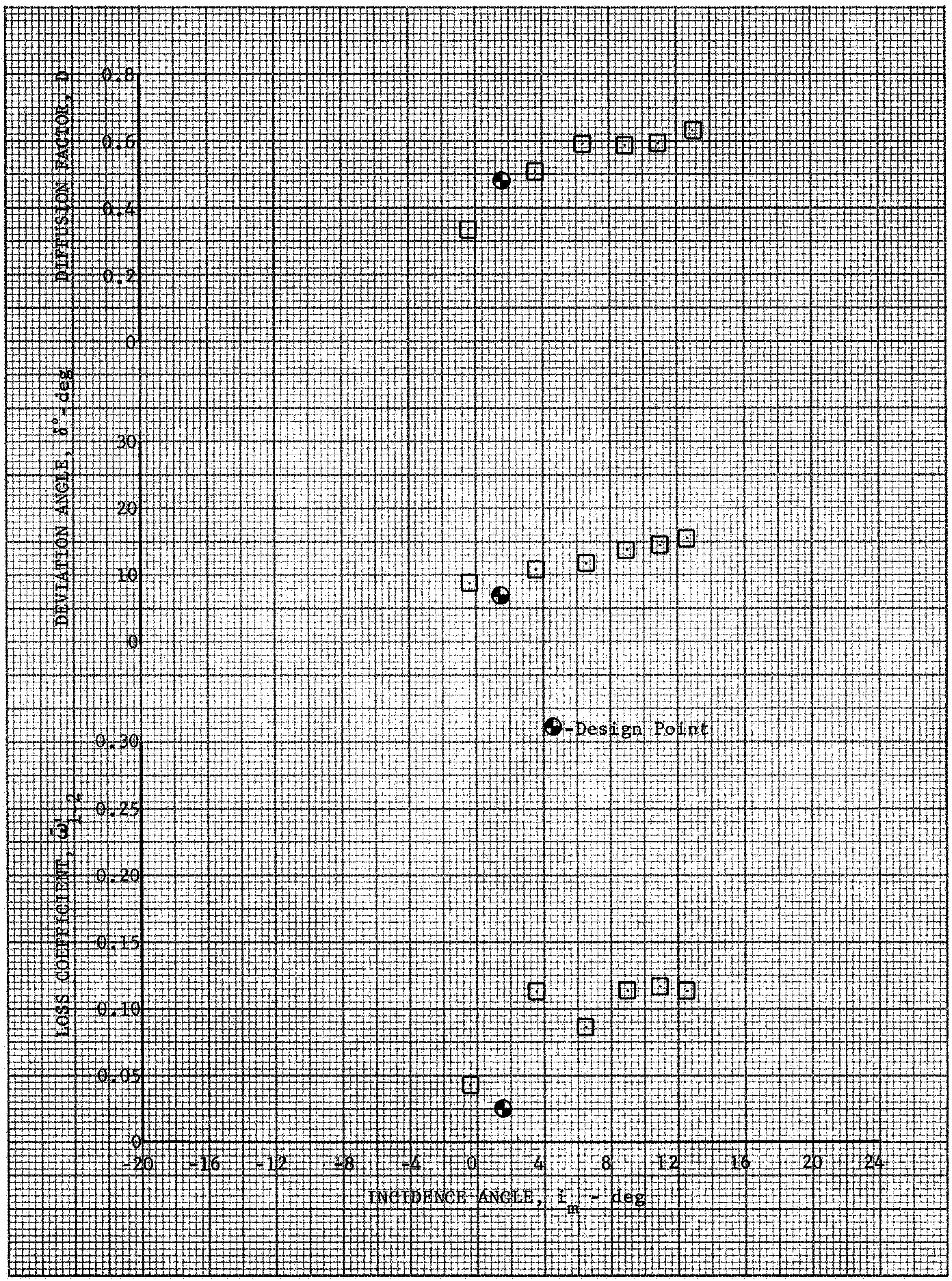


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Figure 30. Rotor Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 90% Span From Tip

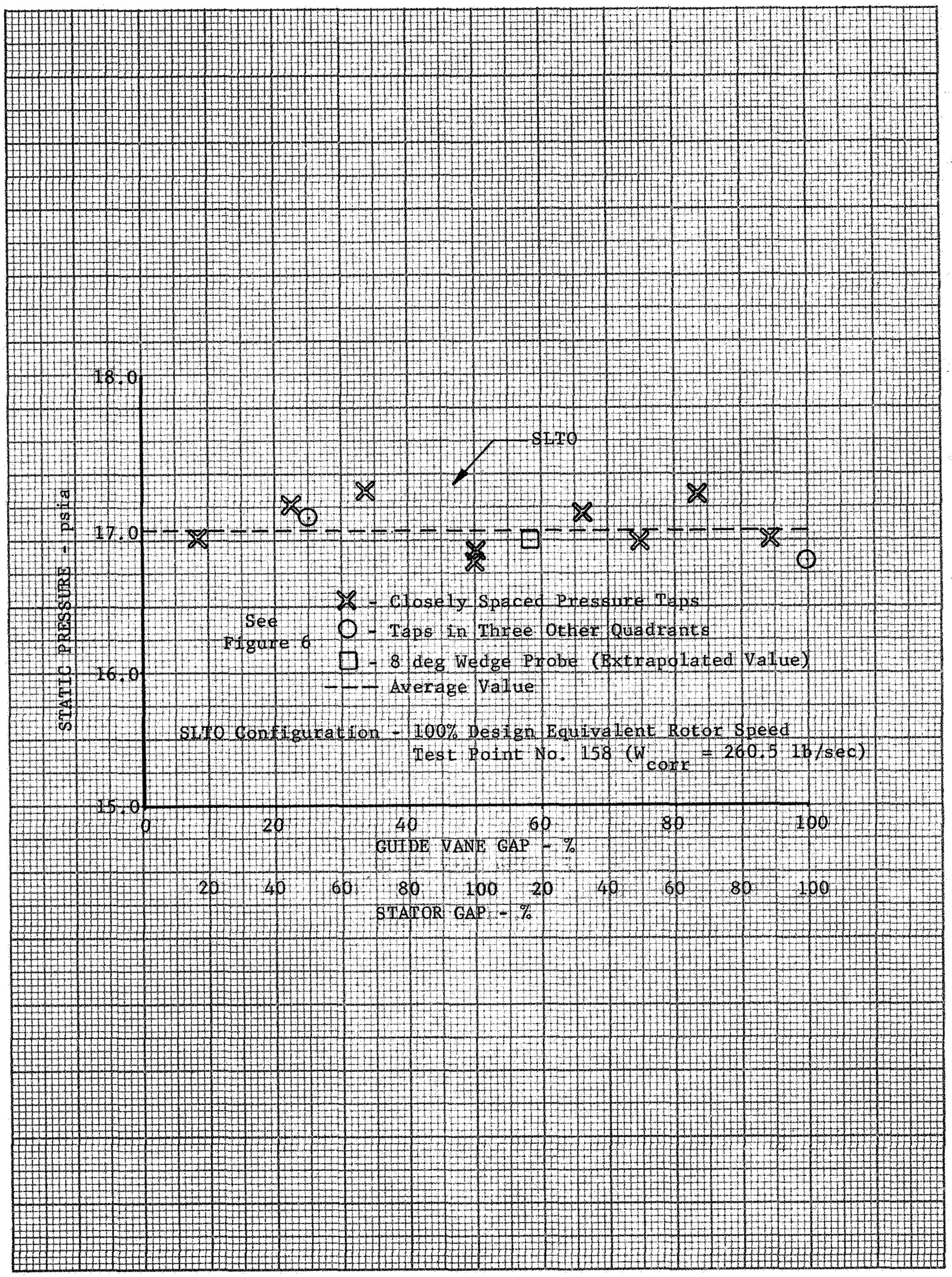


Figure 31. Influence of Guide Vane Wake and Stator on Station 2 Outer Wall Static Pressure

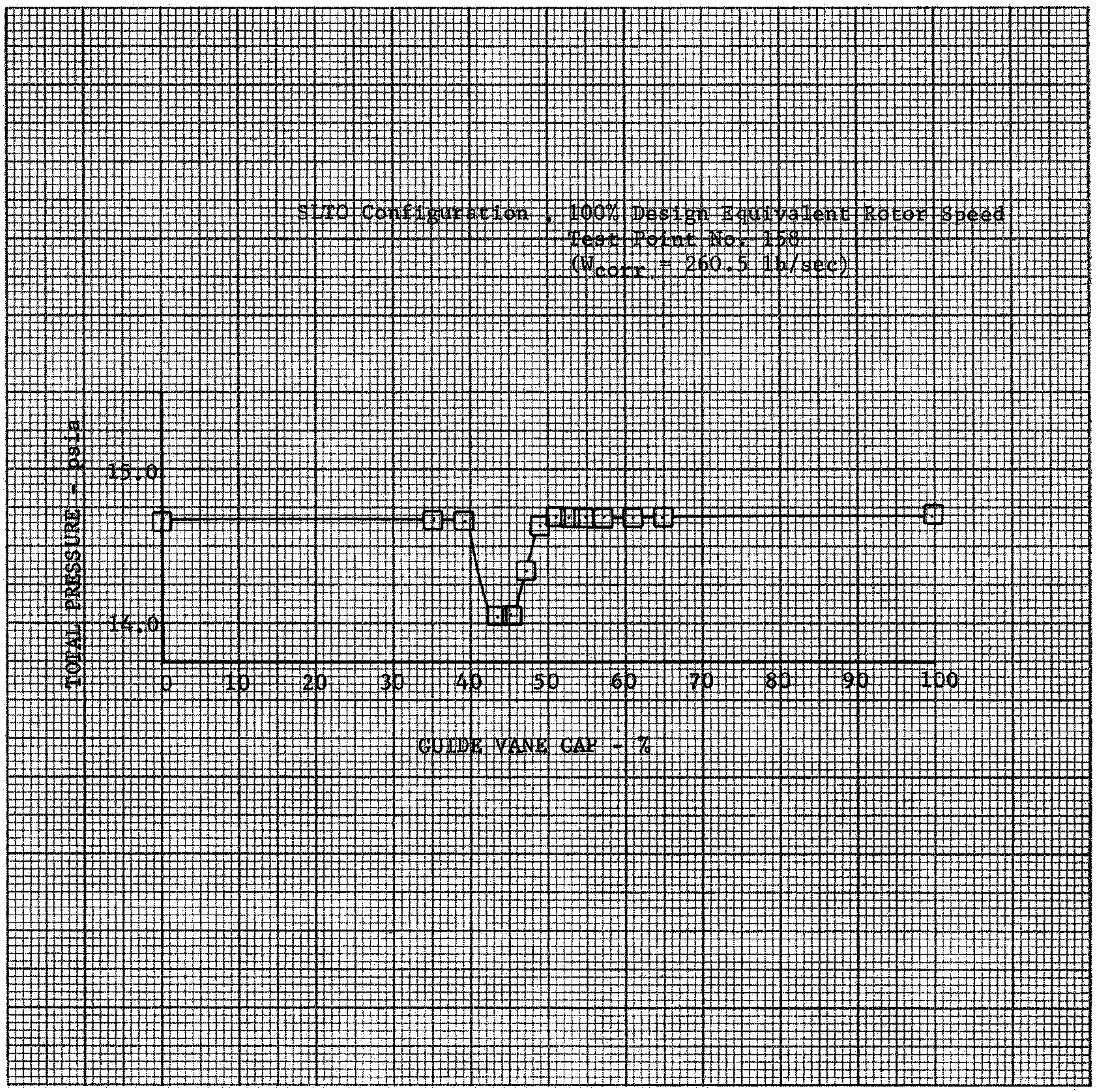


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Figure 32. Guide Vane Wake 10% From Tip

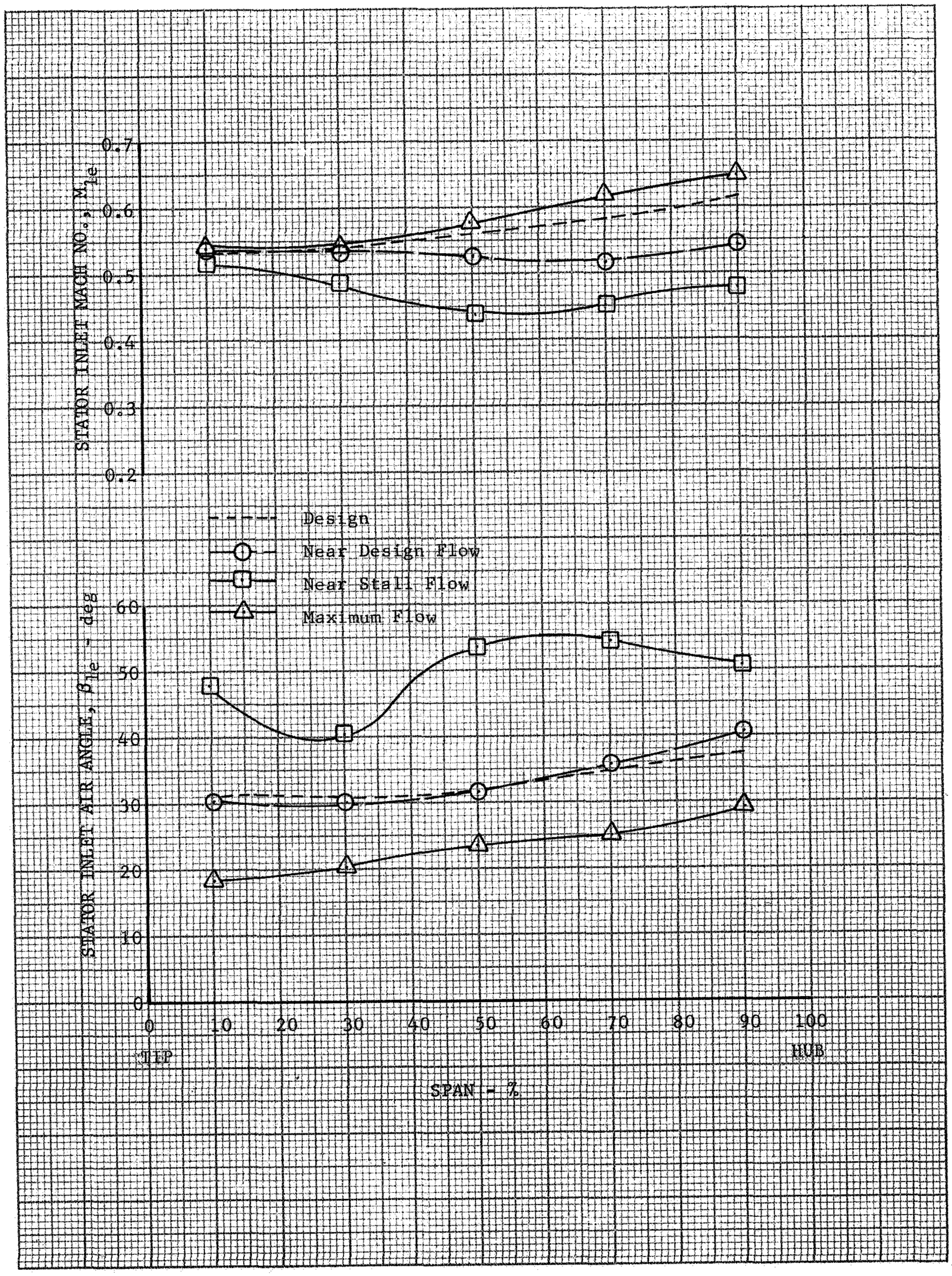


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Figure 33. Stator Inlet Air Angle and Mach Number Distribution: SLTO Configuration, 100% Equivalent Rotor Speed

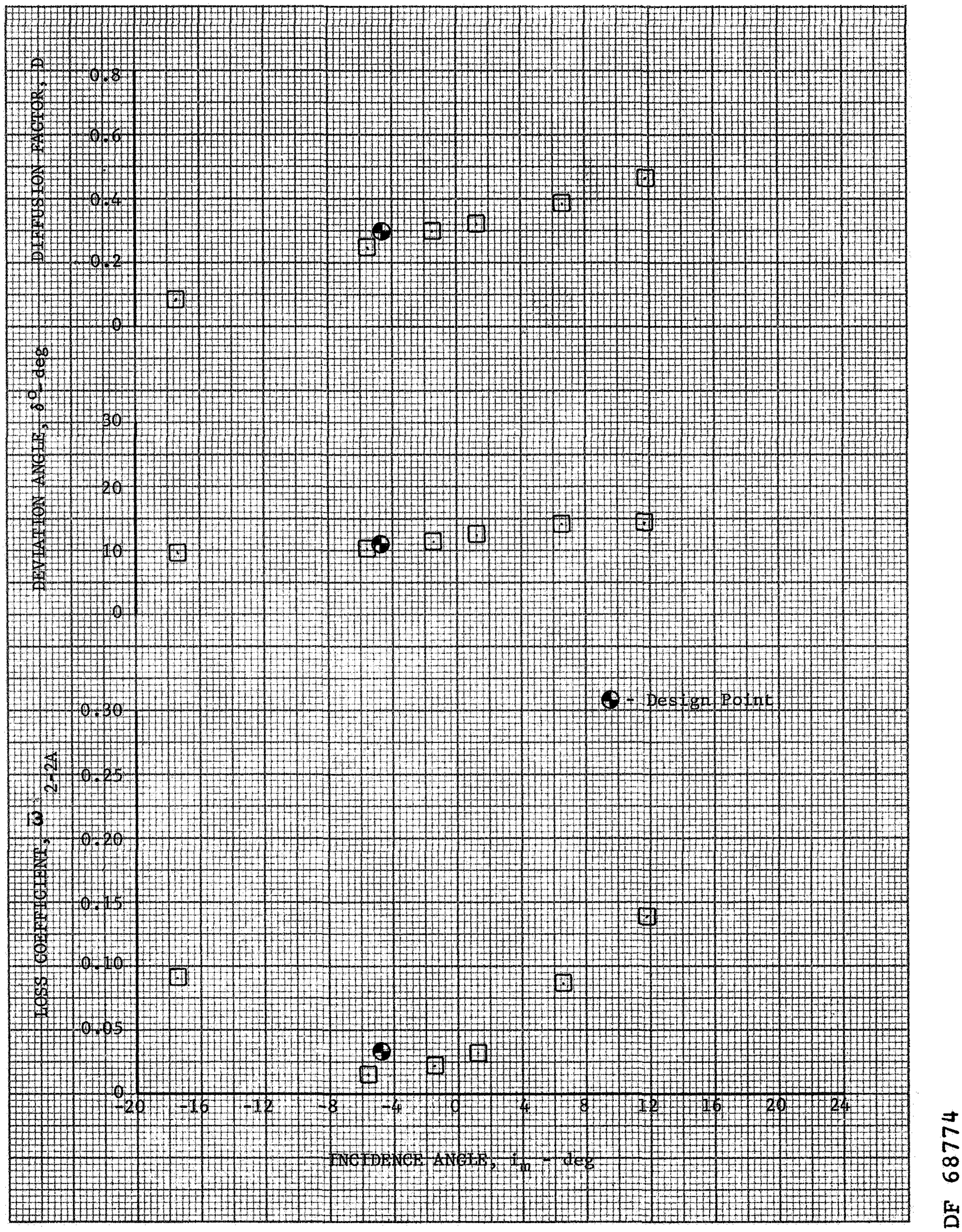


Figure 34. Stator Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 10% Span From Tip

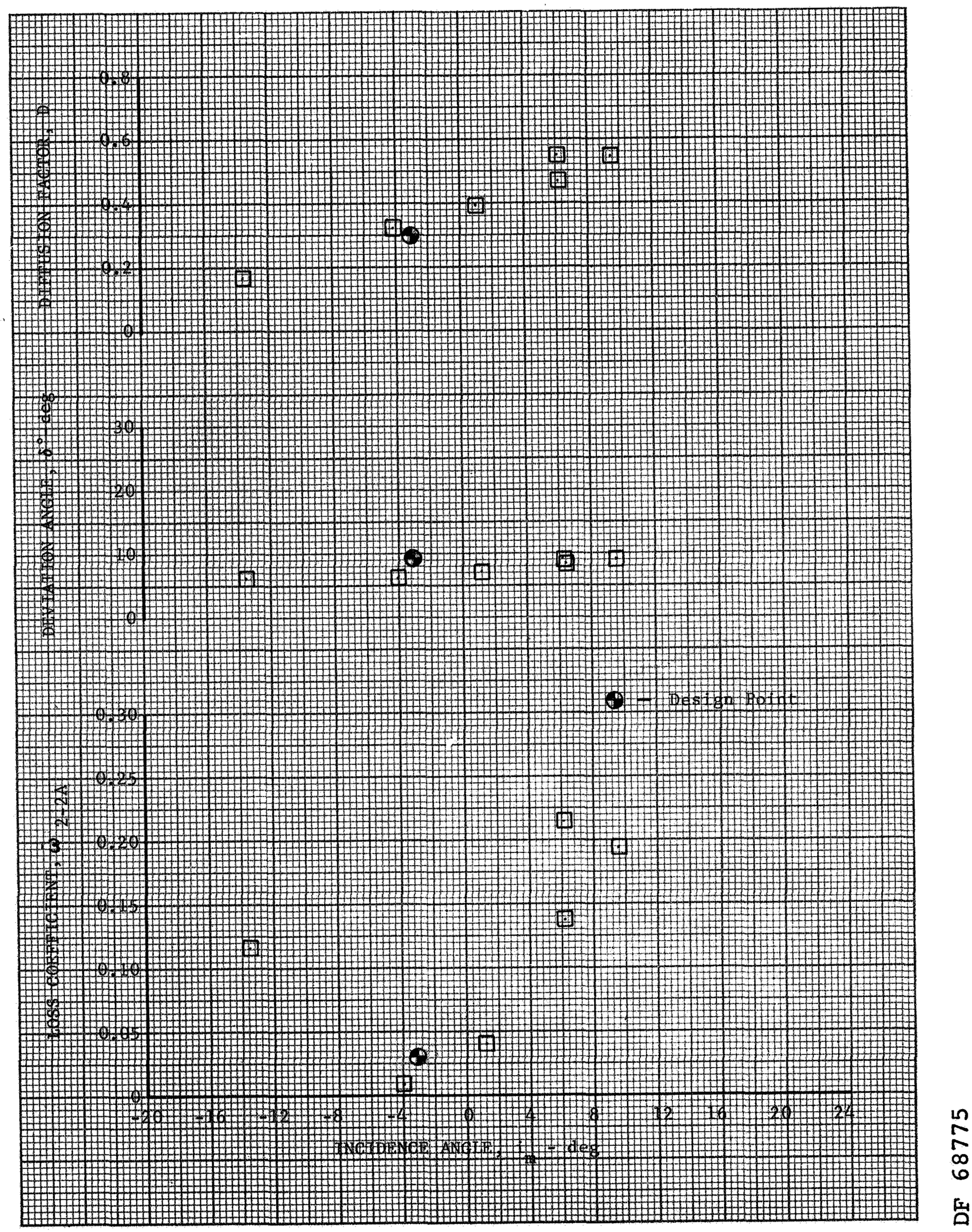


Figure 35. Stator Blade Element Performance: SLTO Configuration, 100% Rotor Speed, 30% Span From Tip

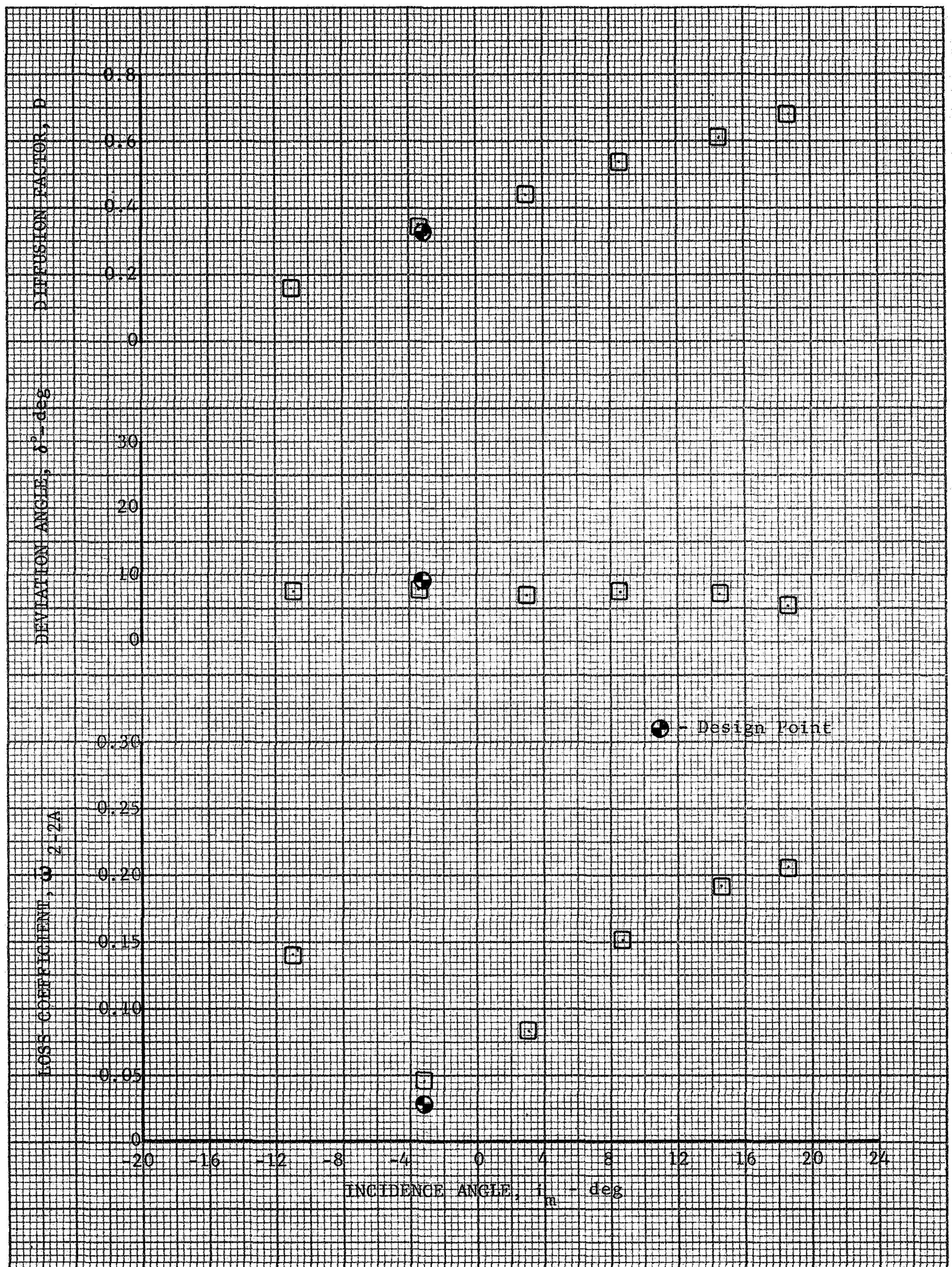


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Figure 36. Stator Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 50% Span From Tip

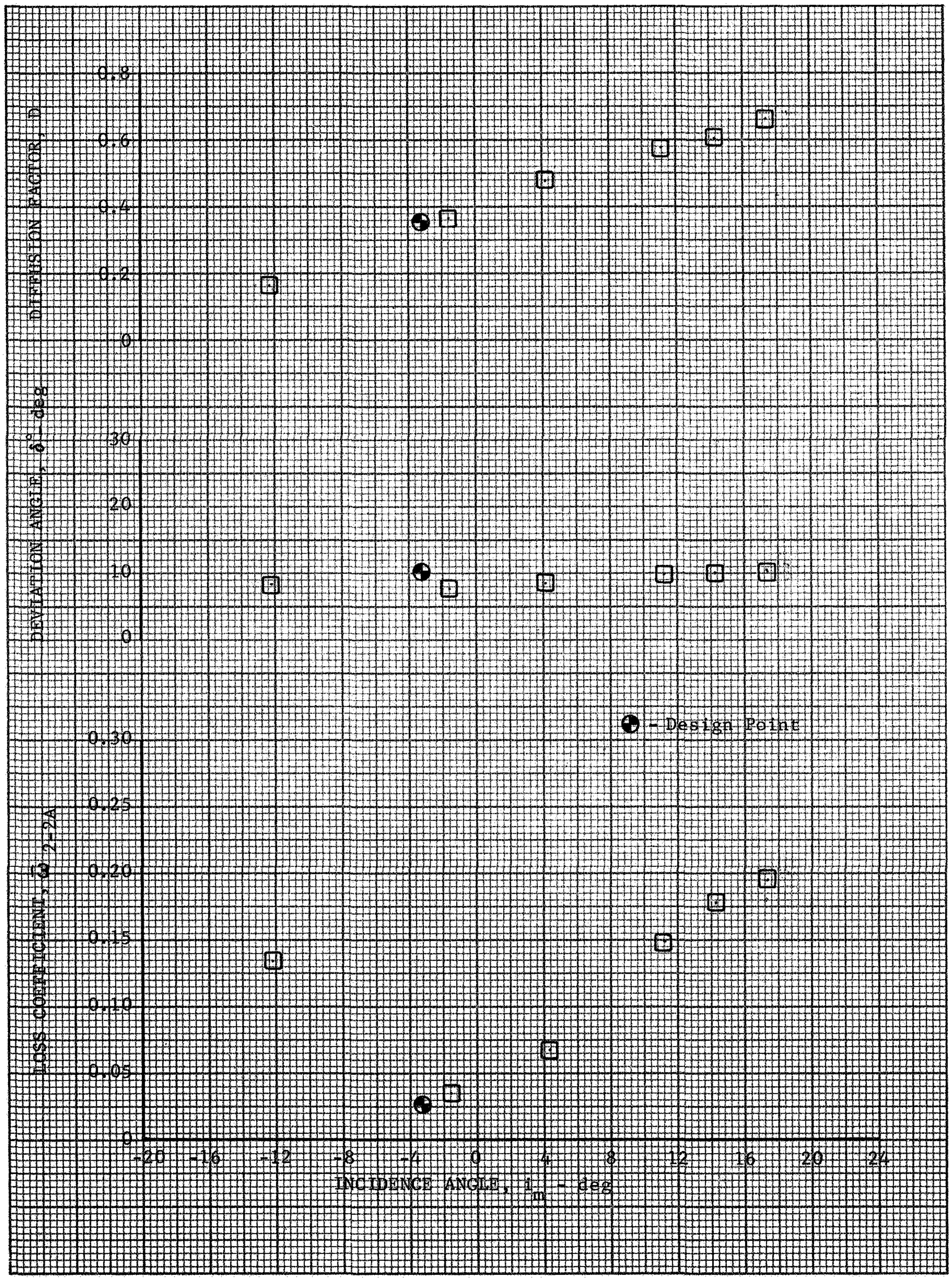


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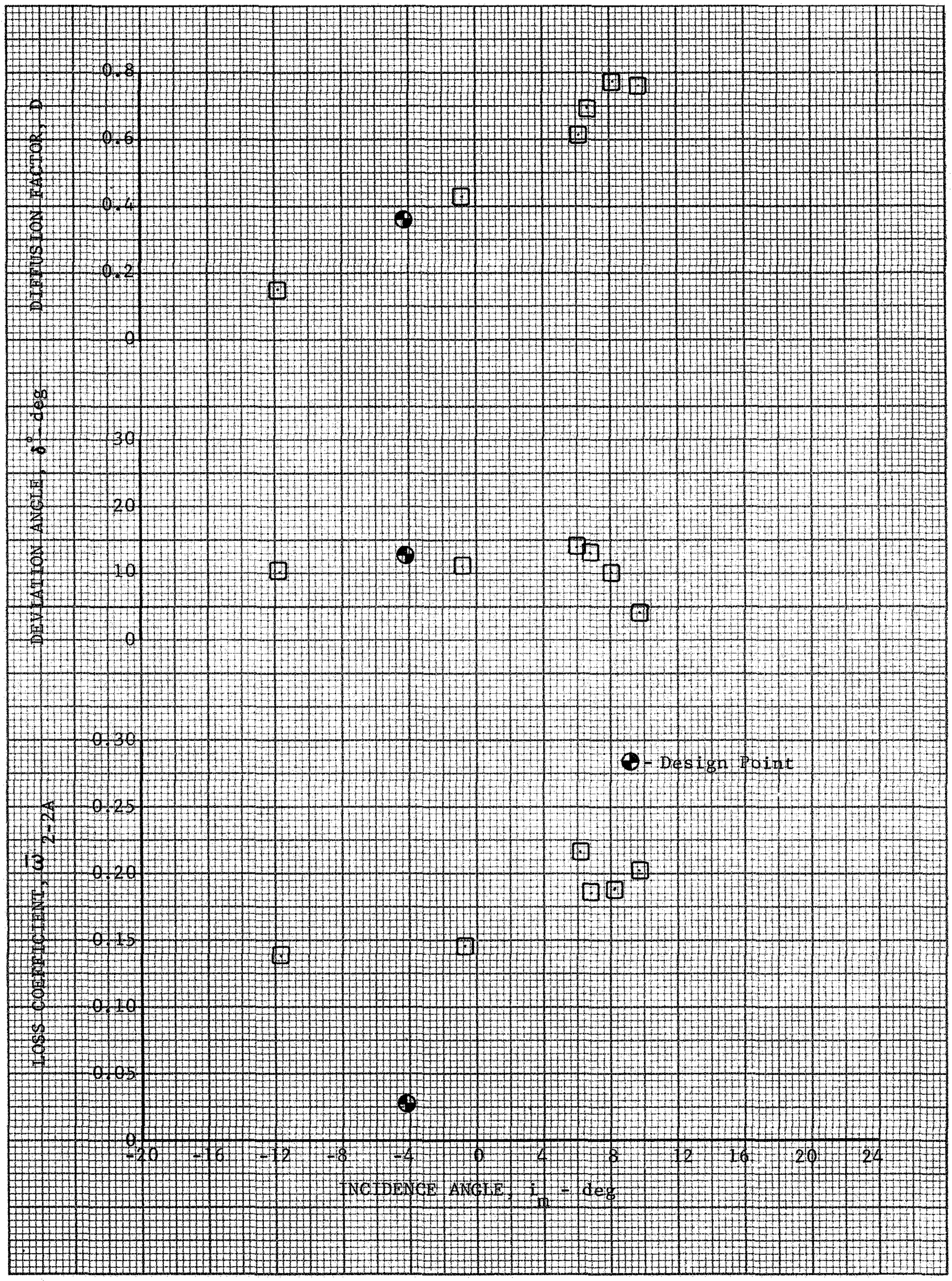
Figure 37. Stator Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 70% Span From Tip




DF 68778

Figure 38. Stator Blade Element Performance: SLTO Configuration, 100% Equivalent Rotor Speed, 90% Span From Tip

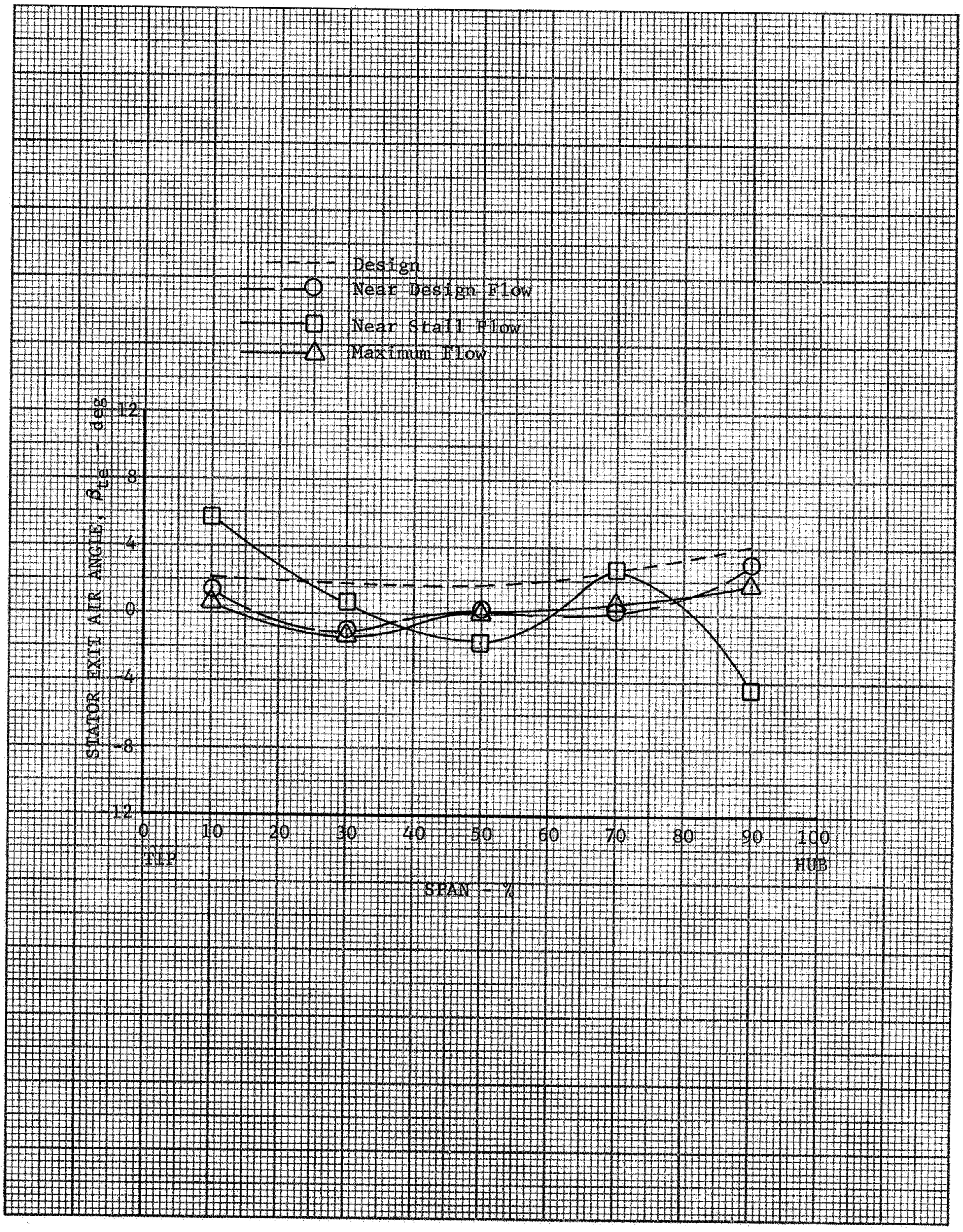
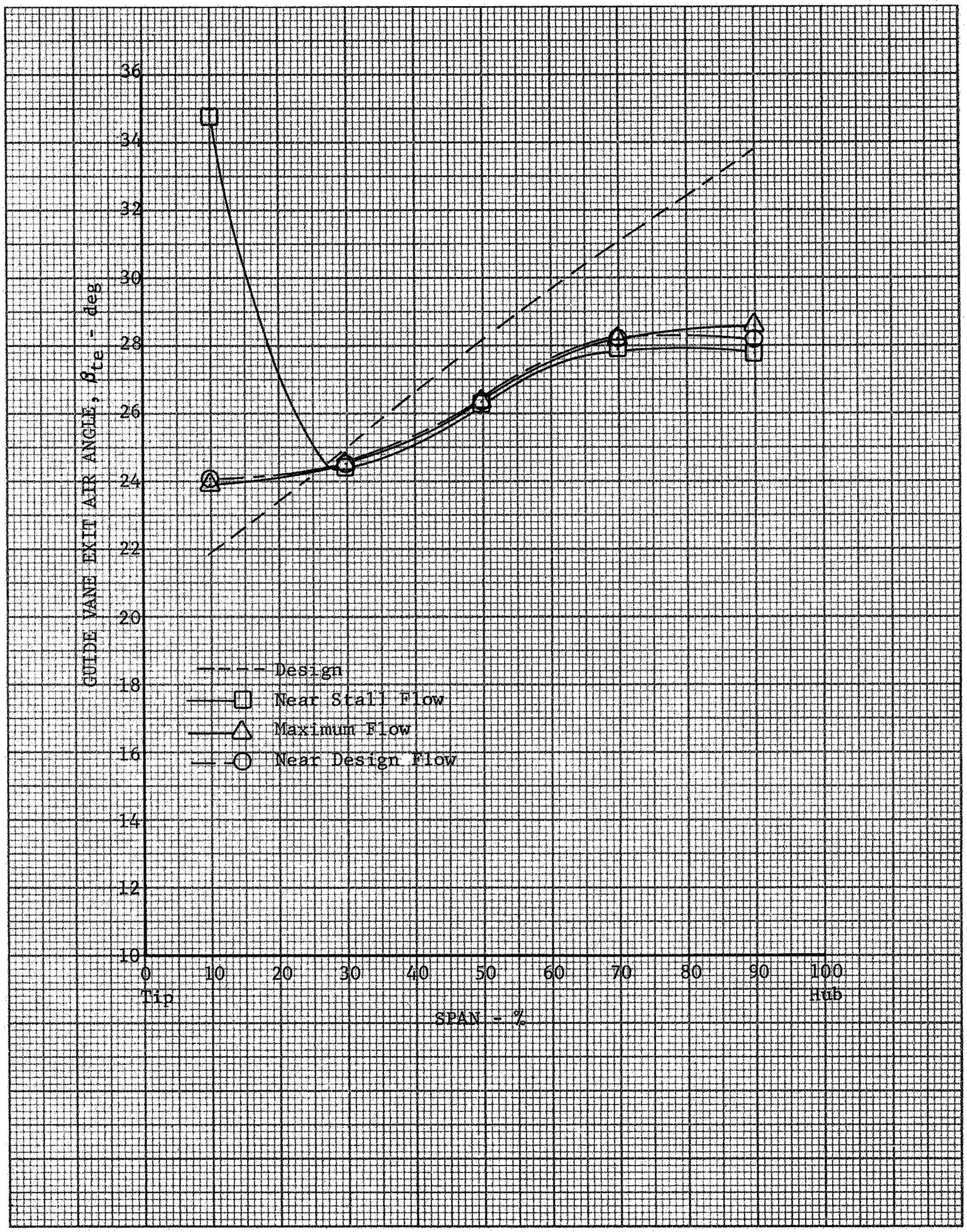



Figure 39. Stator Exit Air Angle vs Percent Span: SLTO Configuration, 100% Equivalent Rotor Speed

DF 68779




DF 68780

Figure 40. Guide Vane Exit Air Angle: Cruise Configuration, 70% Equivalent Rotor Speed

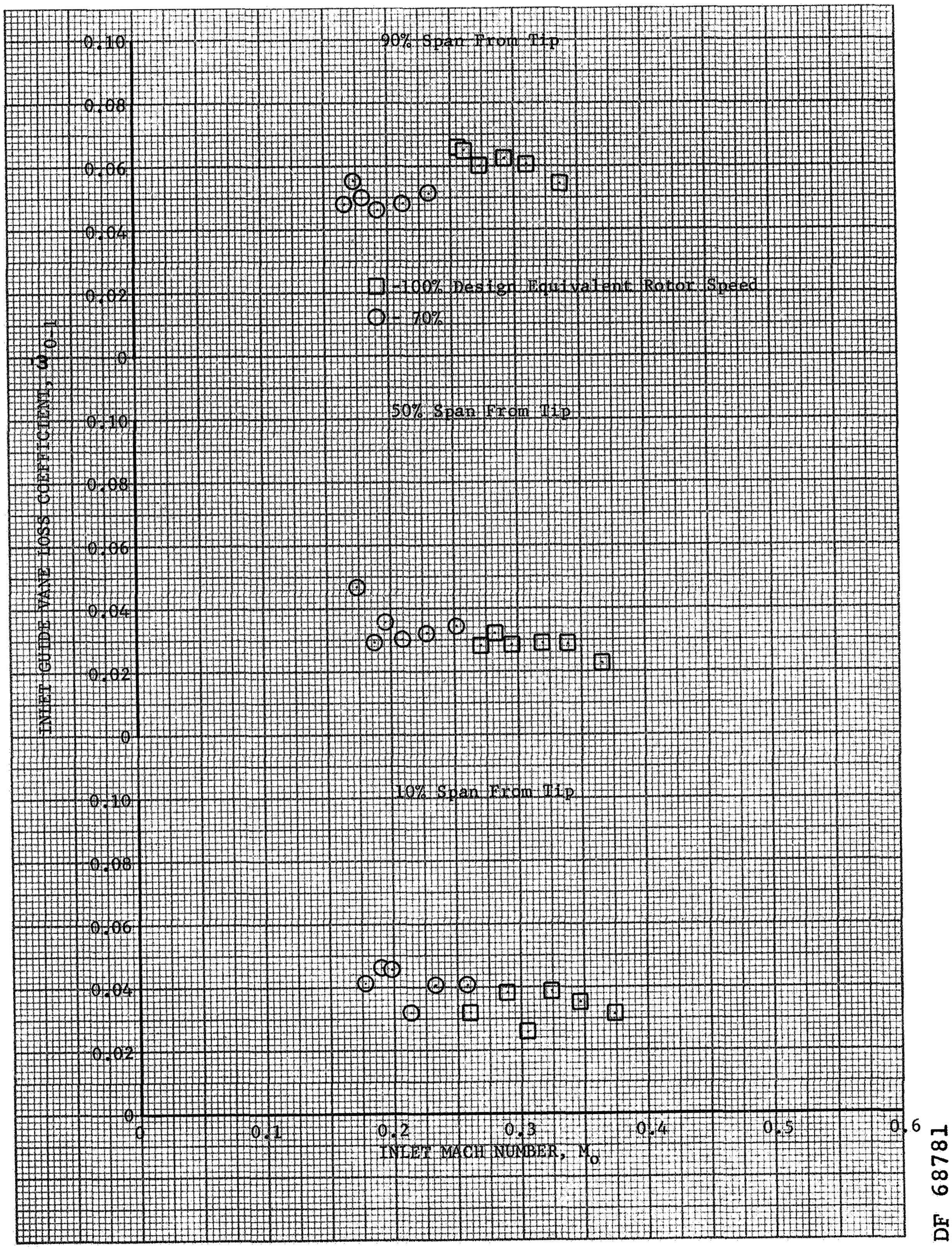



Figure 41. Inlet Guide Vane Loss Coefficient vs Inlet Mach Number: Cruise Configuration

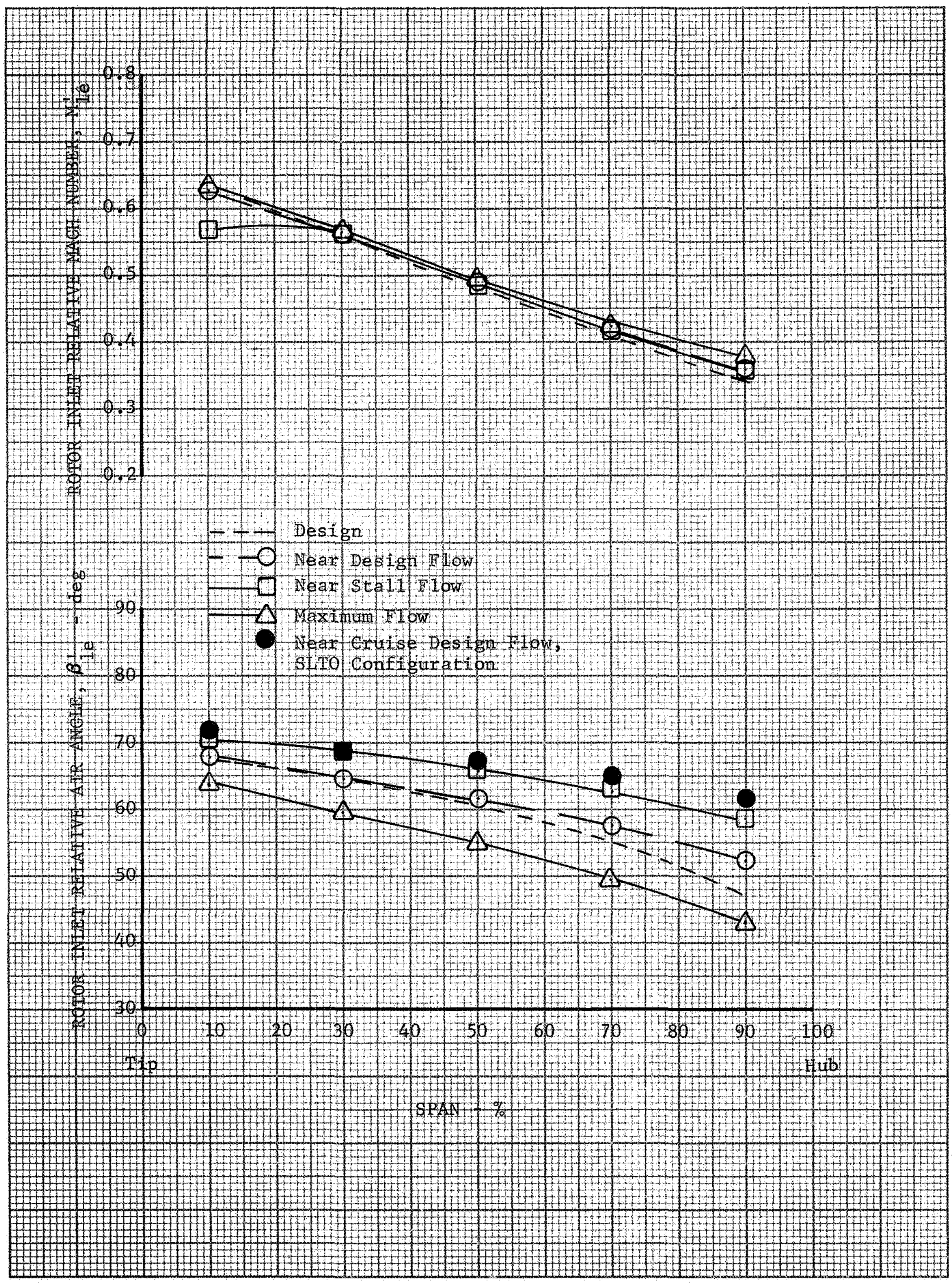
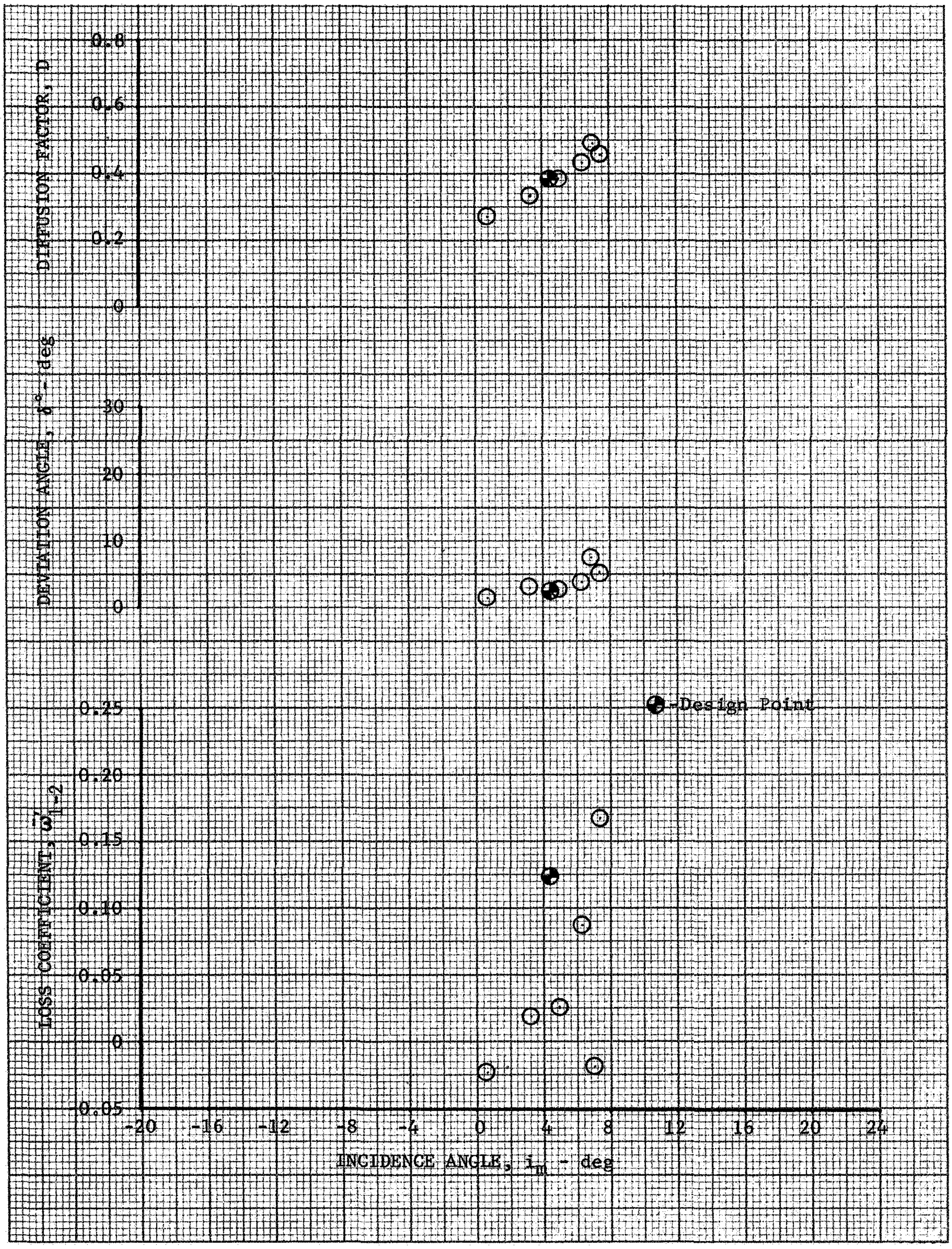
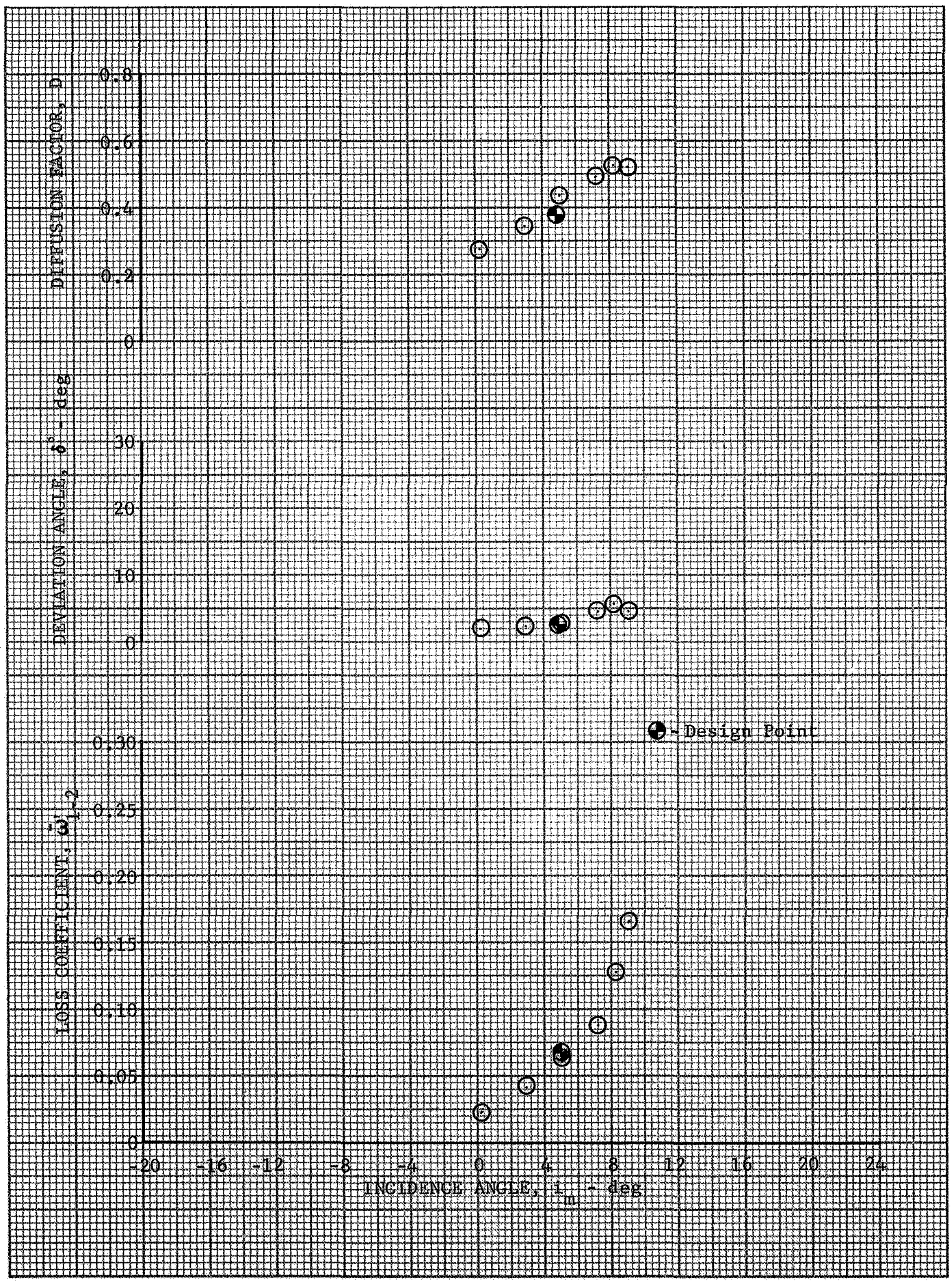



Figure 42. Rotor Inlet Air Angle and Mach Number Distribution: Cruise Configuration, 70% Equivalent Rotor Speed



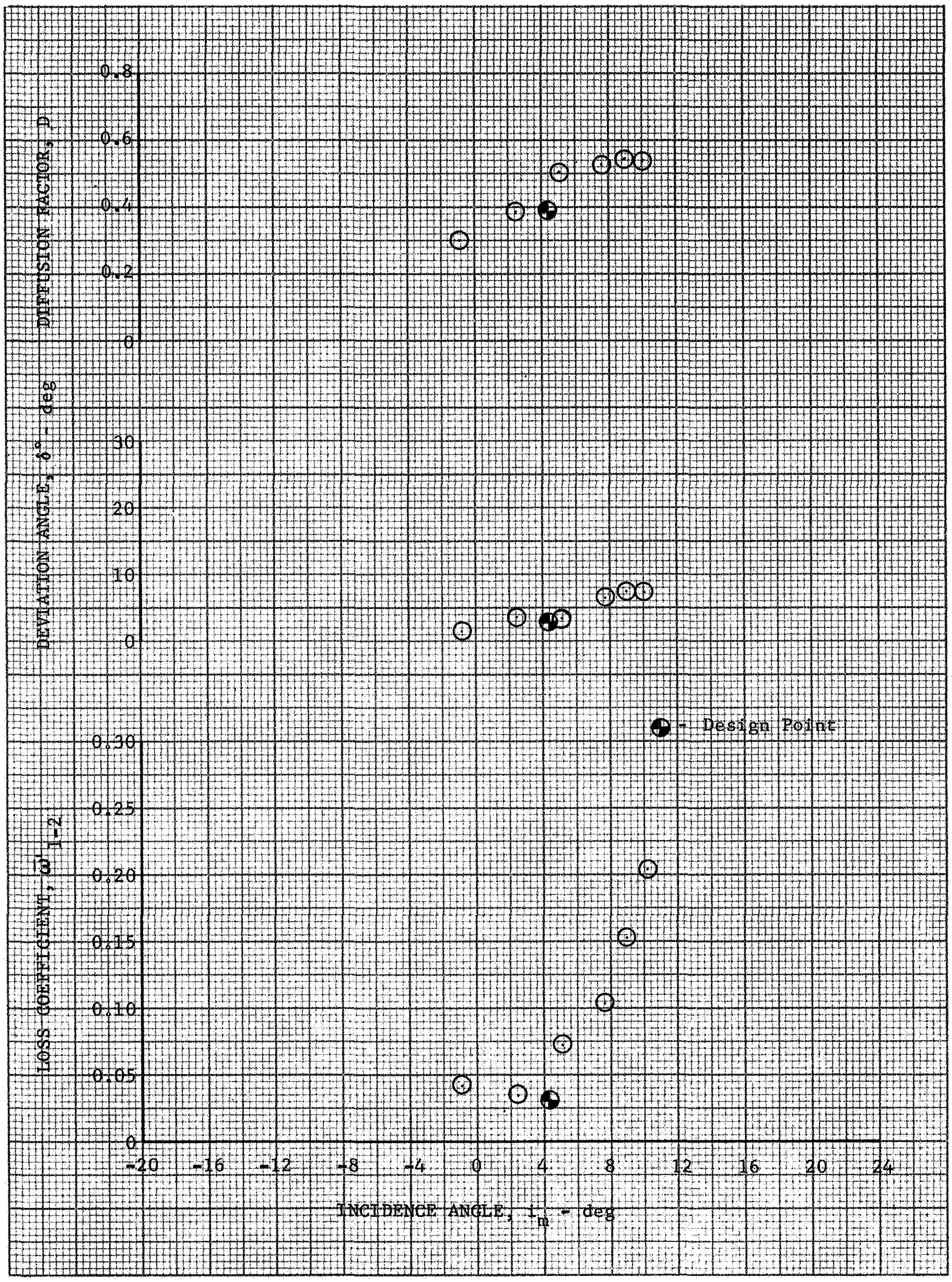

DF 68783

Figure 43. Rotor Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 10% Span From Tip




DF 68784

Figure 44. Rotor Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 30% Span From Tip




DF 68785

Figure 45. Rotor Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 50% Span From Tip

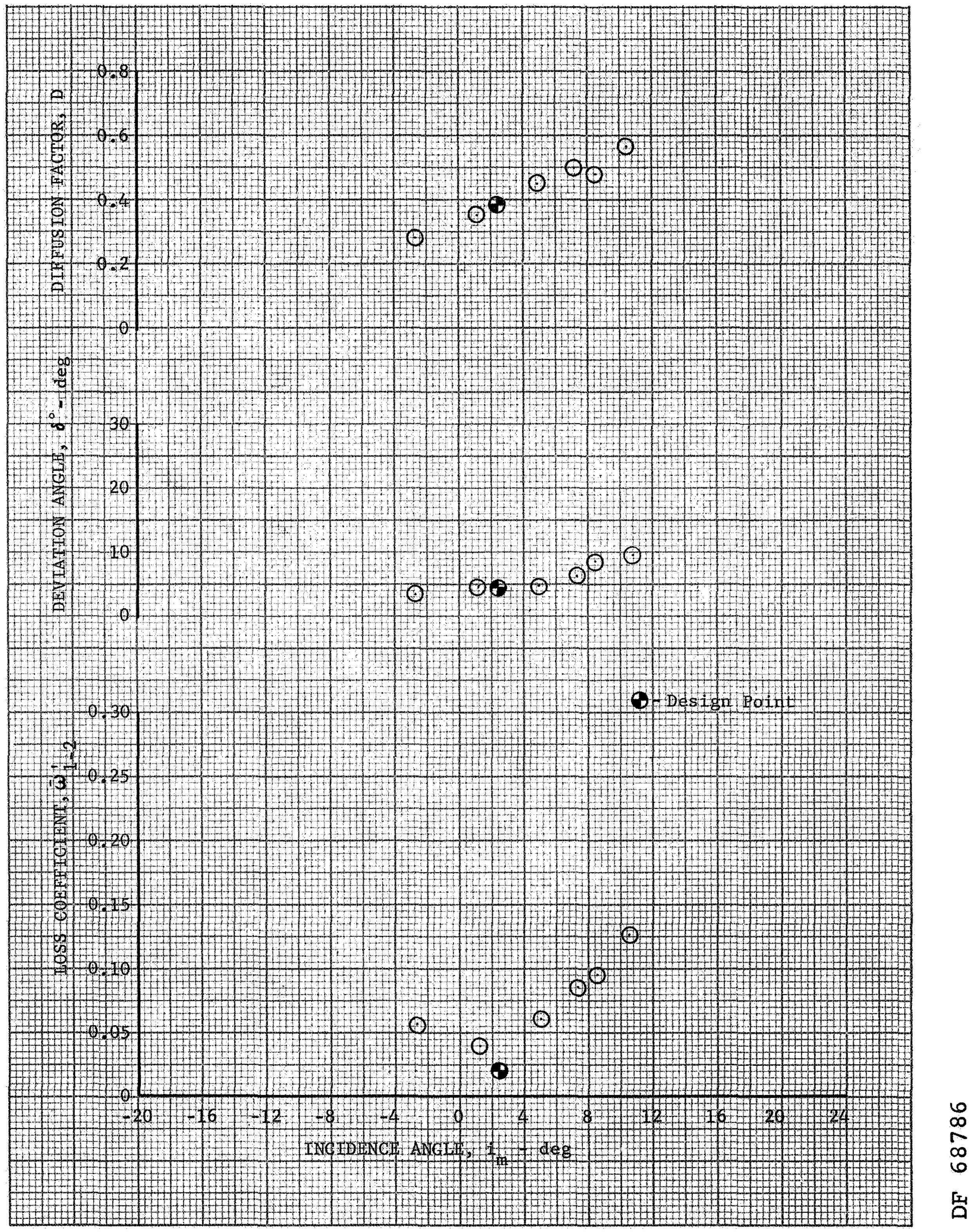



Figure 46. Rotor Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 70% Span From Tip

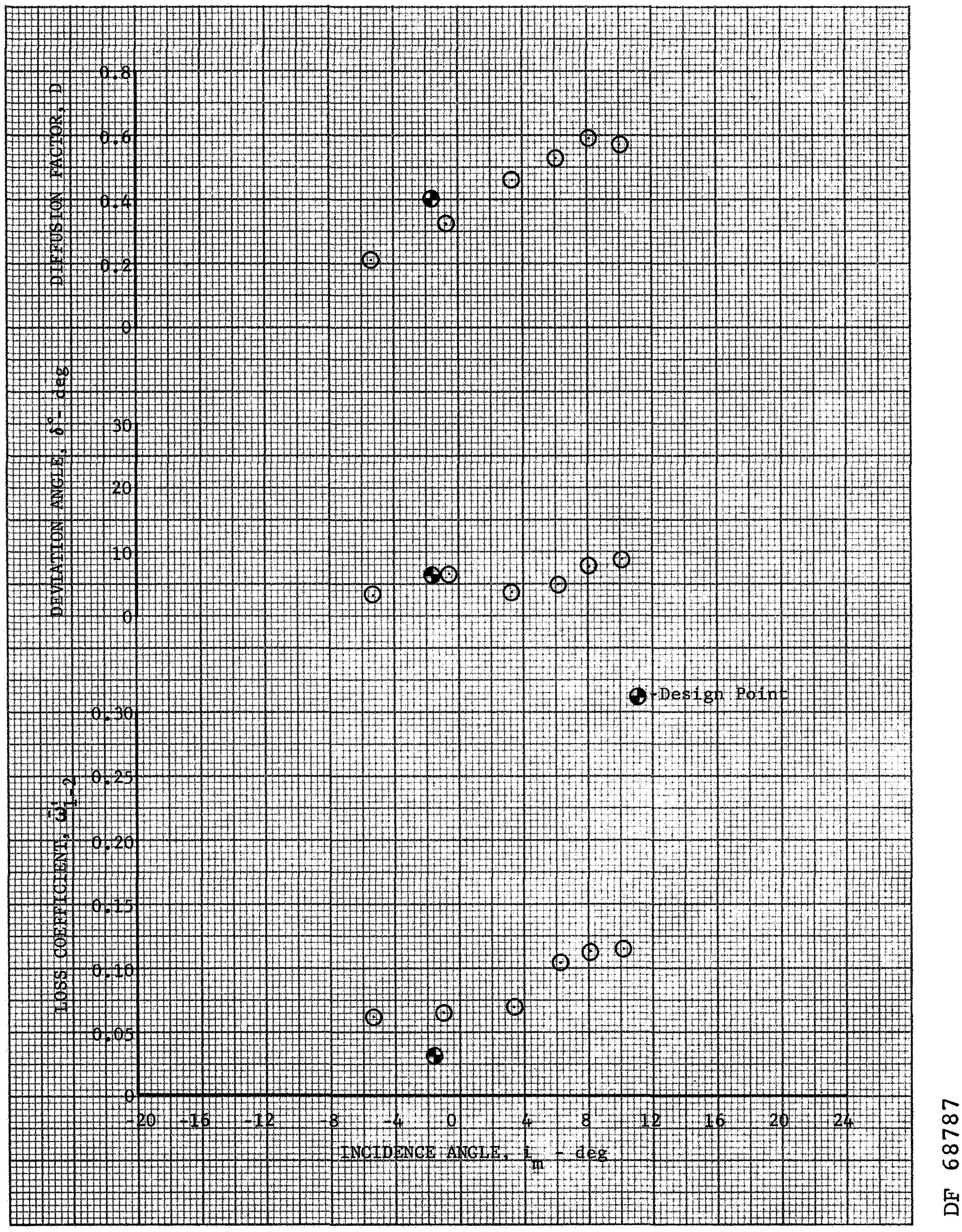



Figure 47. Rotor Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 90% Span From Tip

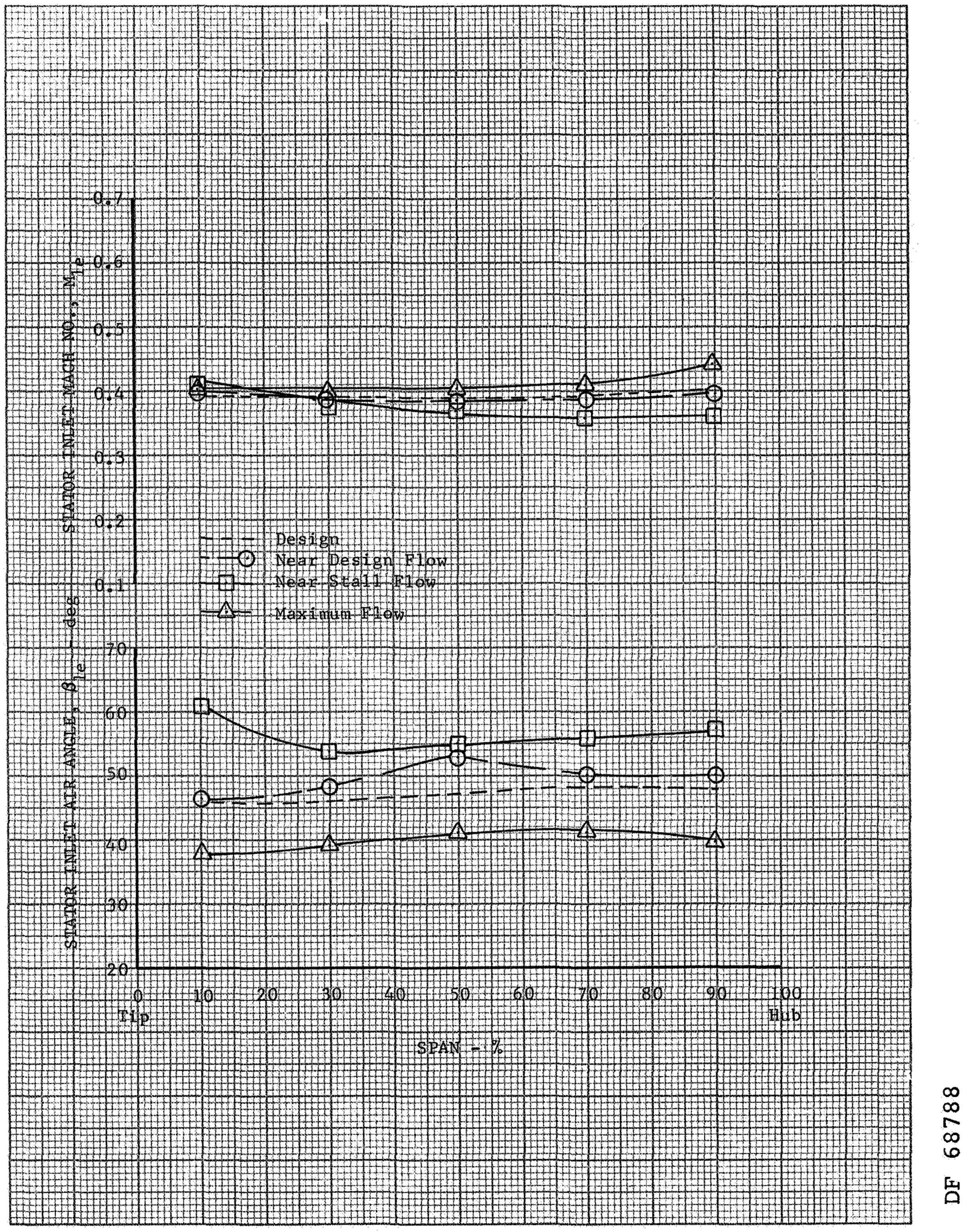



Figure 48. Stator Inlet Air Angle and Mach Number Distribution: Cruise Configuration, 70% Equivalent Rotor Speed

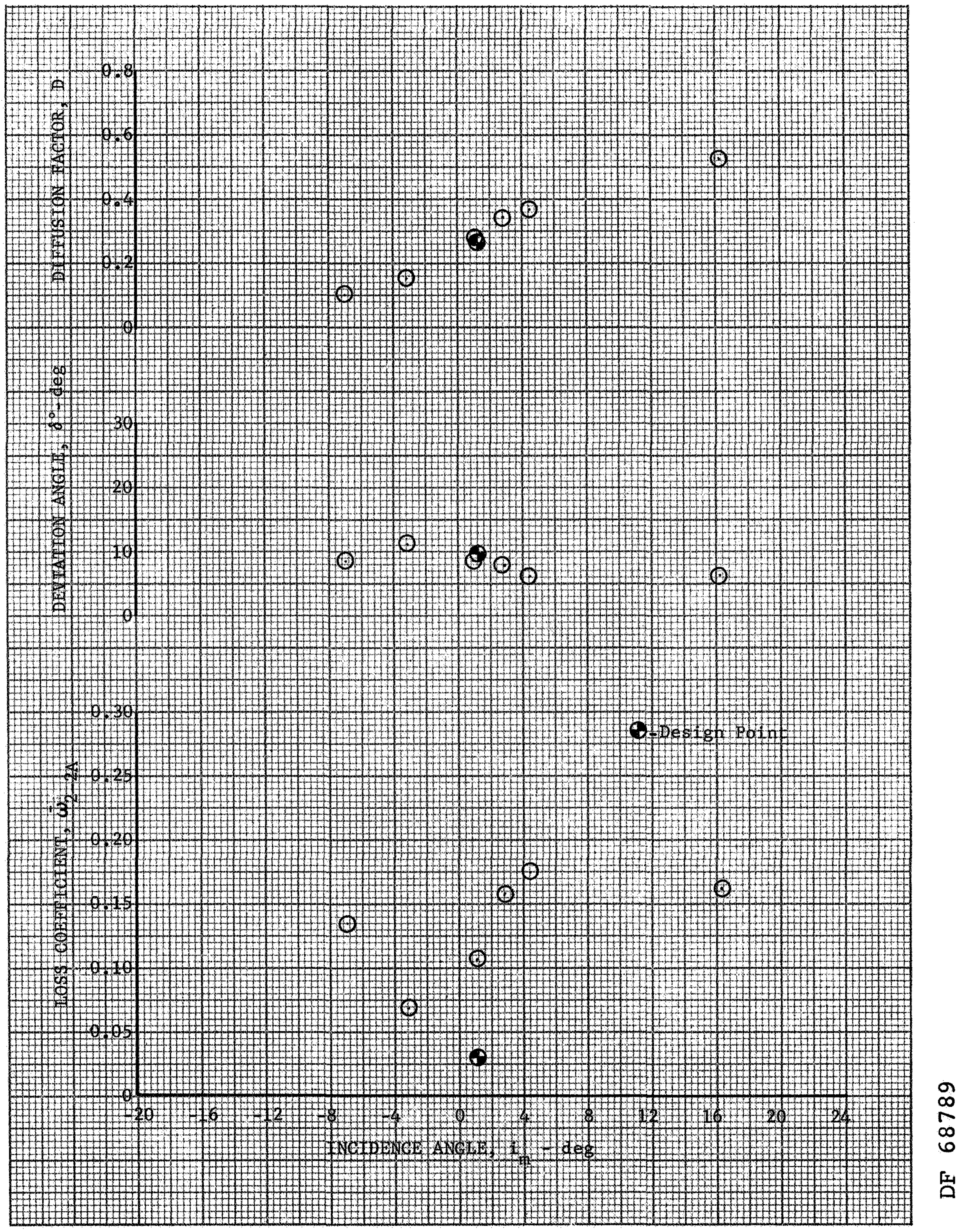



Figure 49. Stator Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 10% Span From Tip

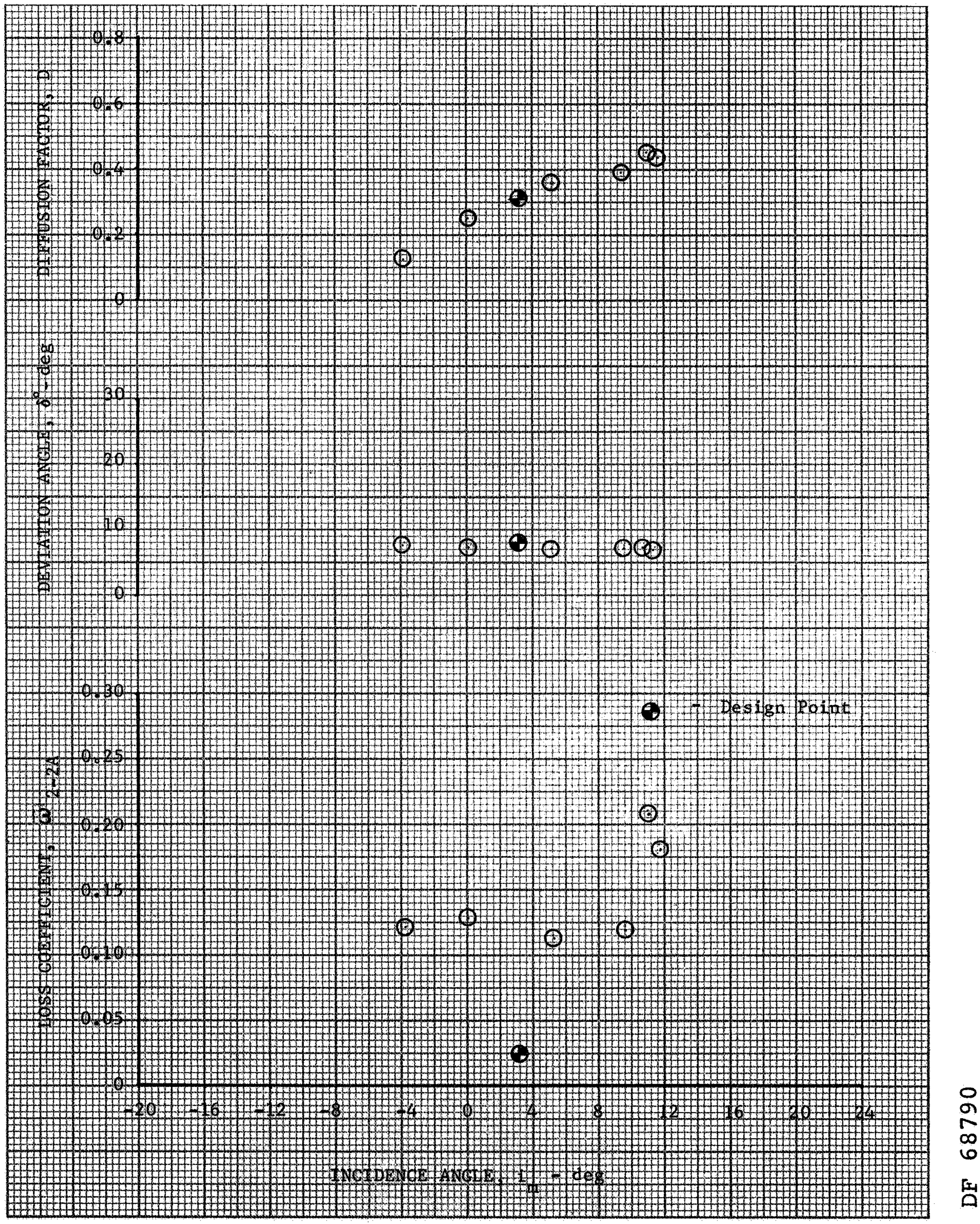



Figure 50. Stator Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 30% Span From Tip

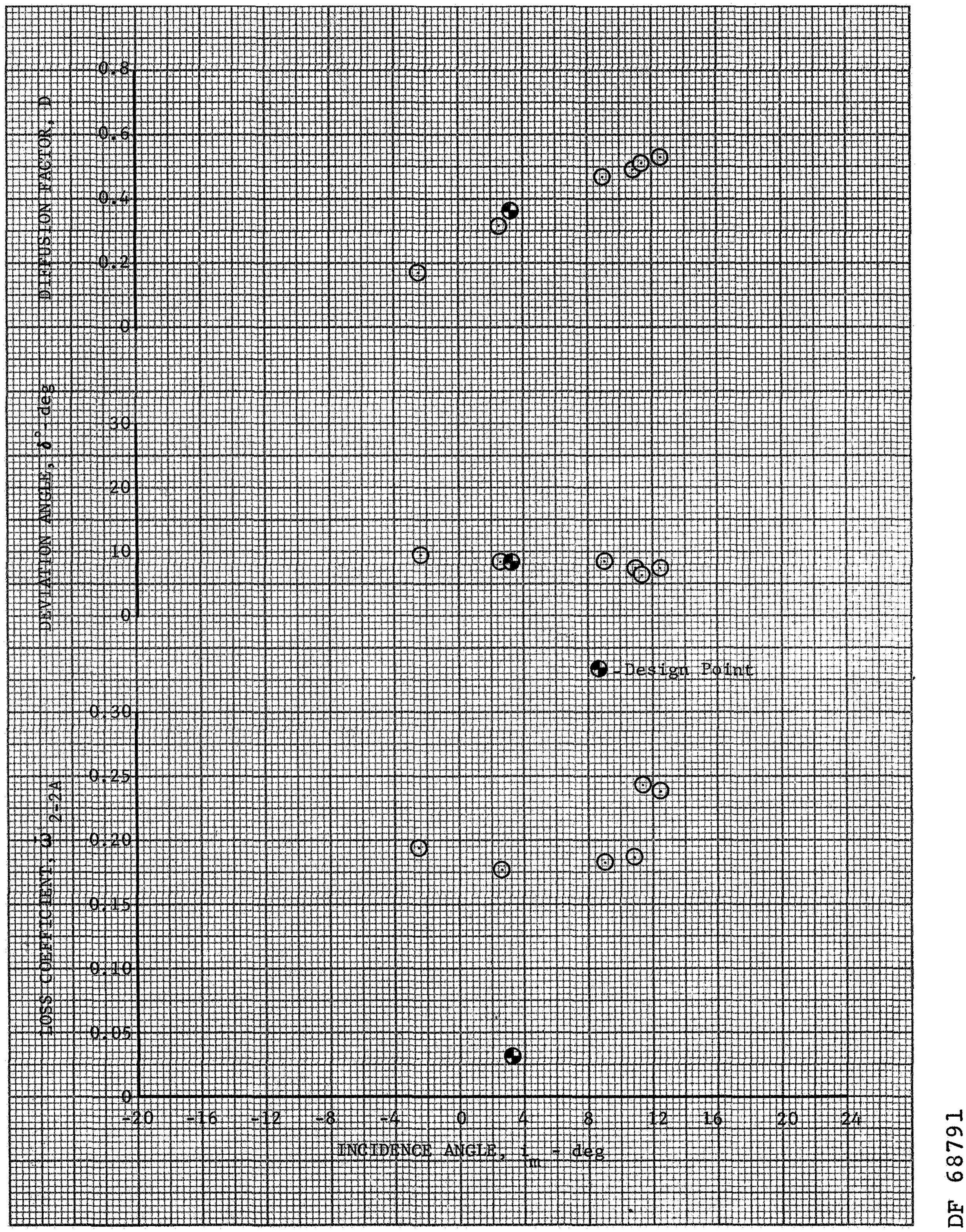



Figure 51. Stator Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 50% Span From Tip

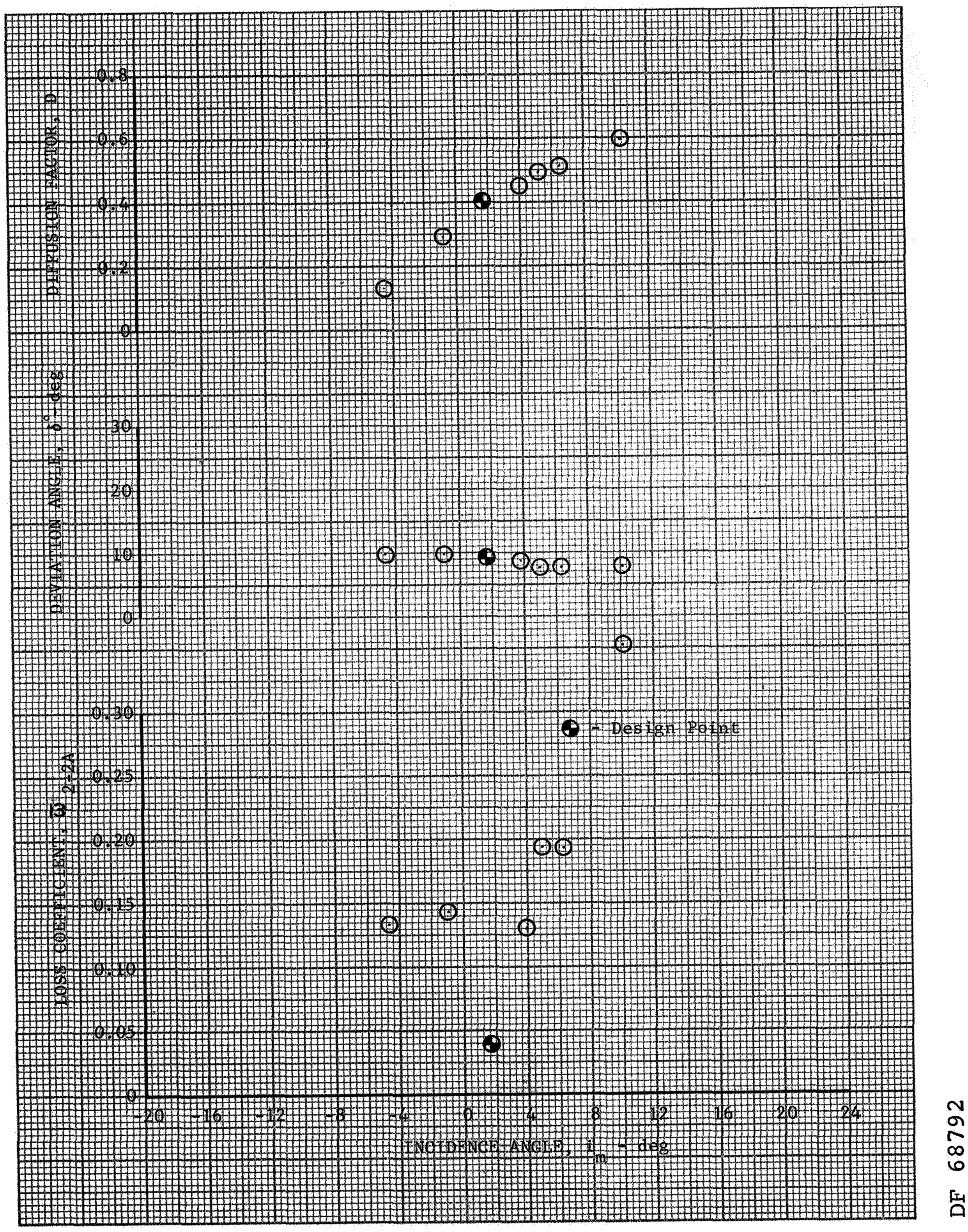



Figure 52. Stator Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 70% Span From Tip

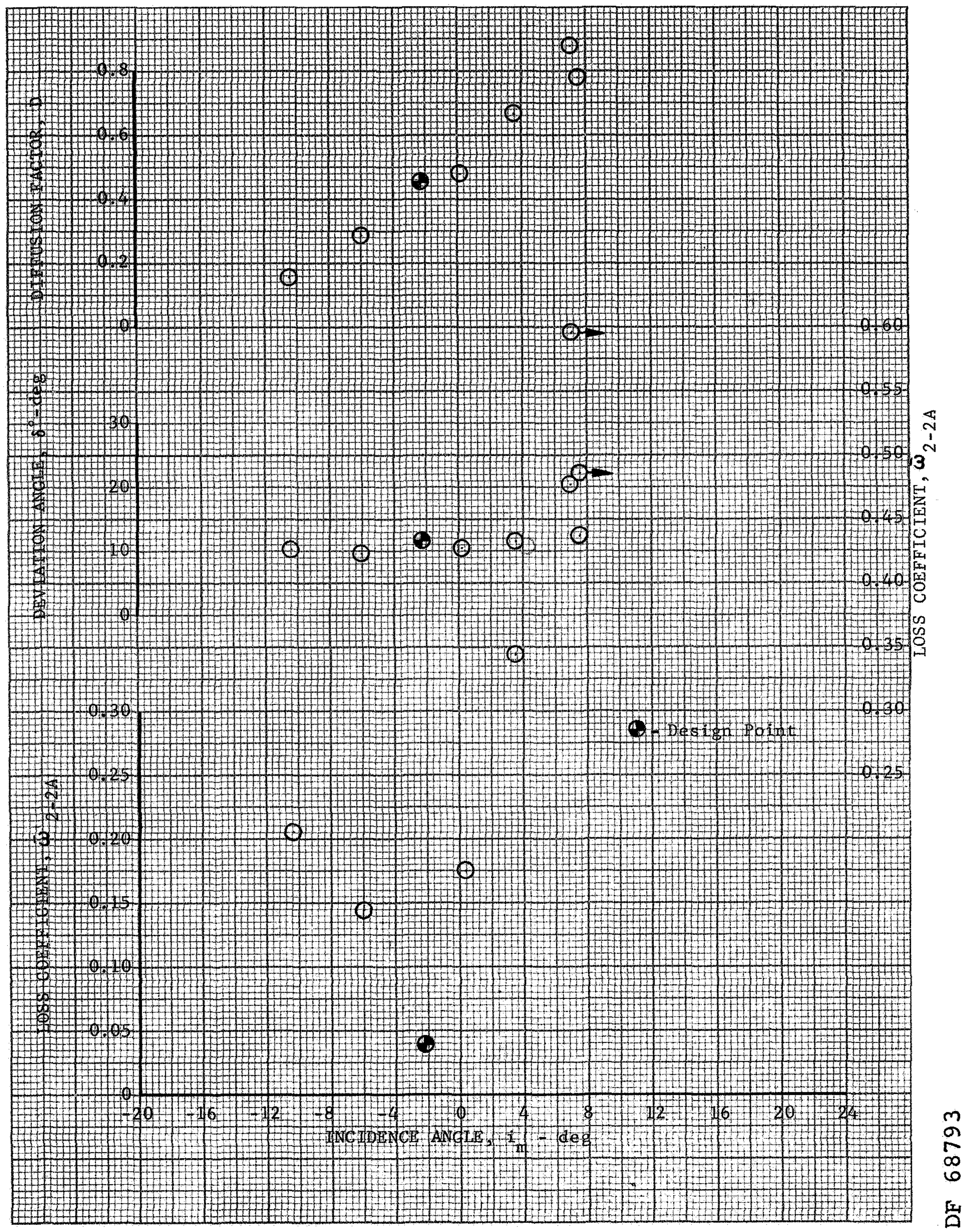



Figure 53. Stator Blade Element Performance: Cruise Configuration, 70% Equivalent Rotor Speed, 90% Span From Tip

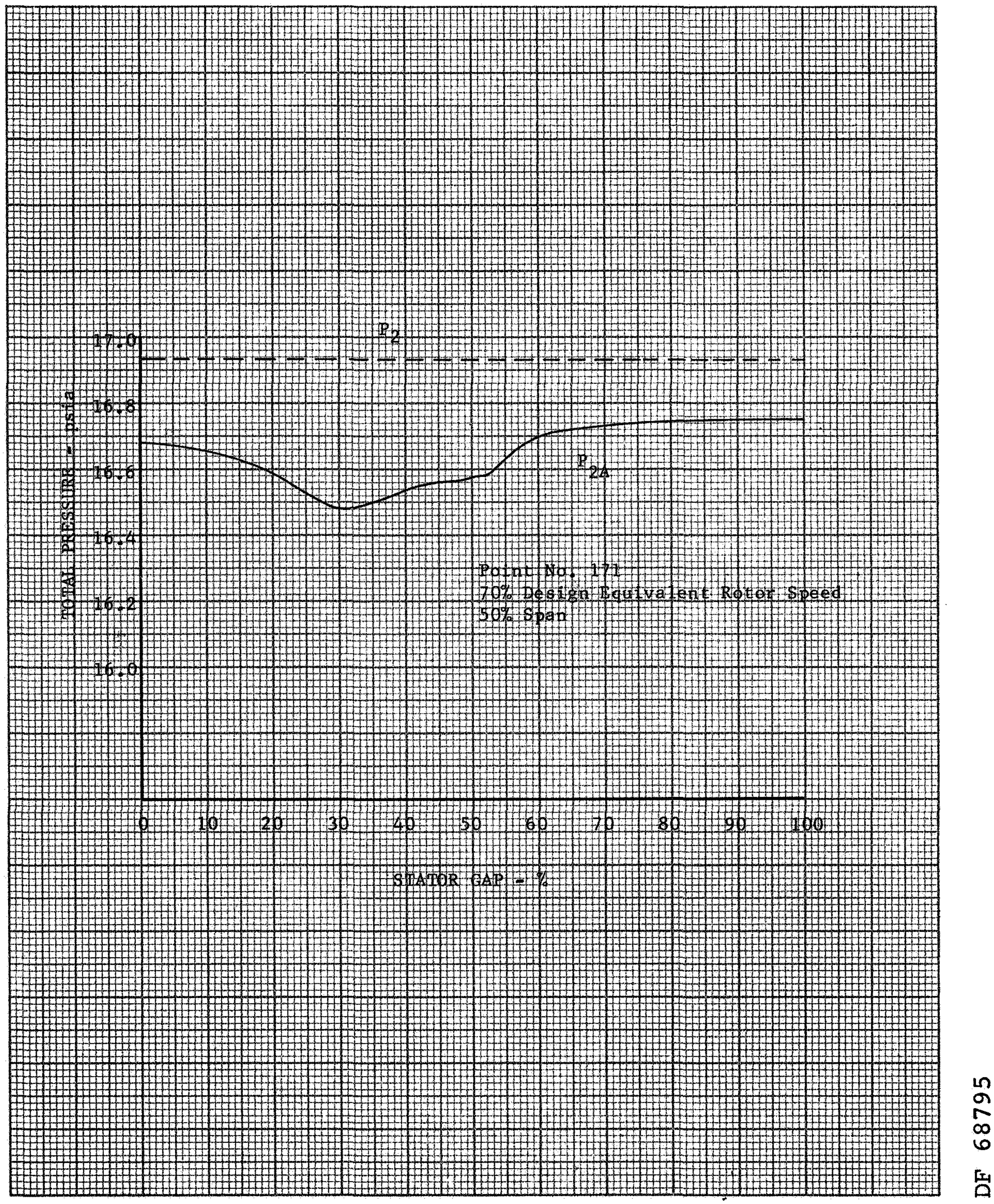
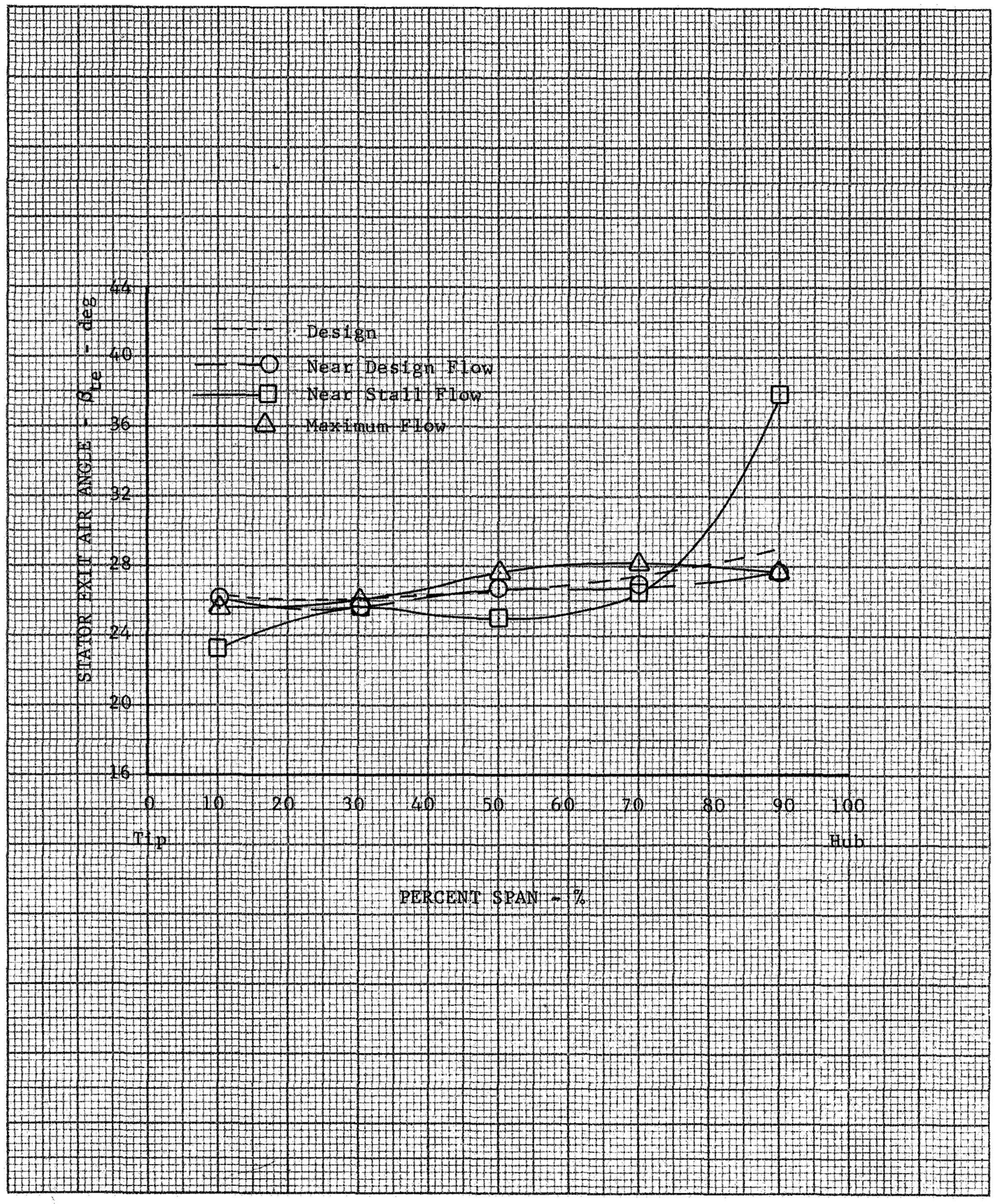



Figure 54. Stator B Cruise Configuration Wake Total Pressure Profile




DF 68794

Figure 55. Stator Exit Air Angle vs Percent Span: Cruise Configuration, 70% Equivalent Rotor Speed

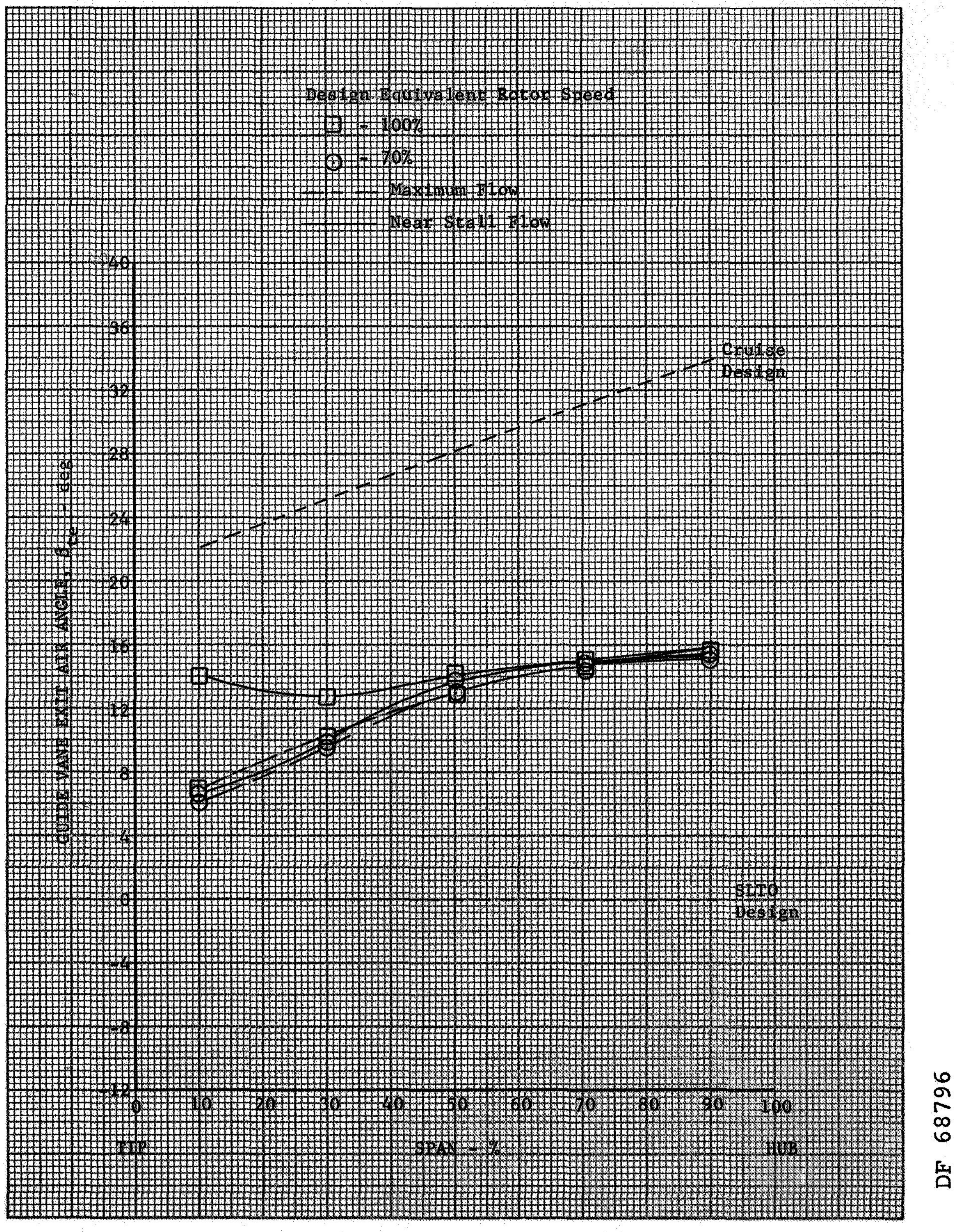



Figure 56. Guide Vane Exit Air Angle: Intermediate Configuration

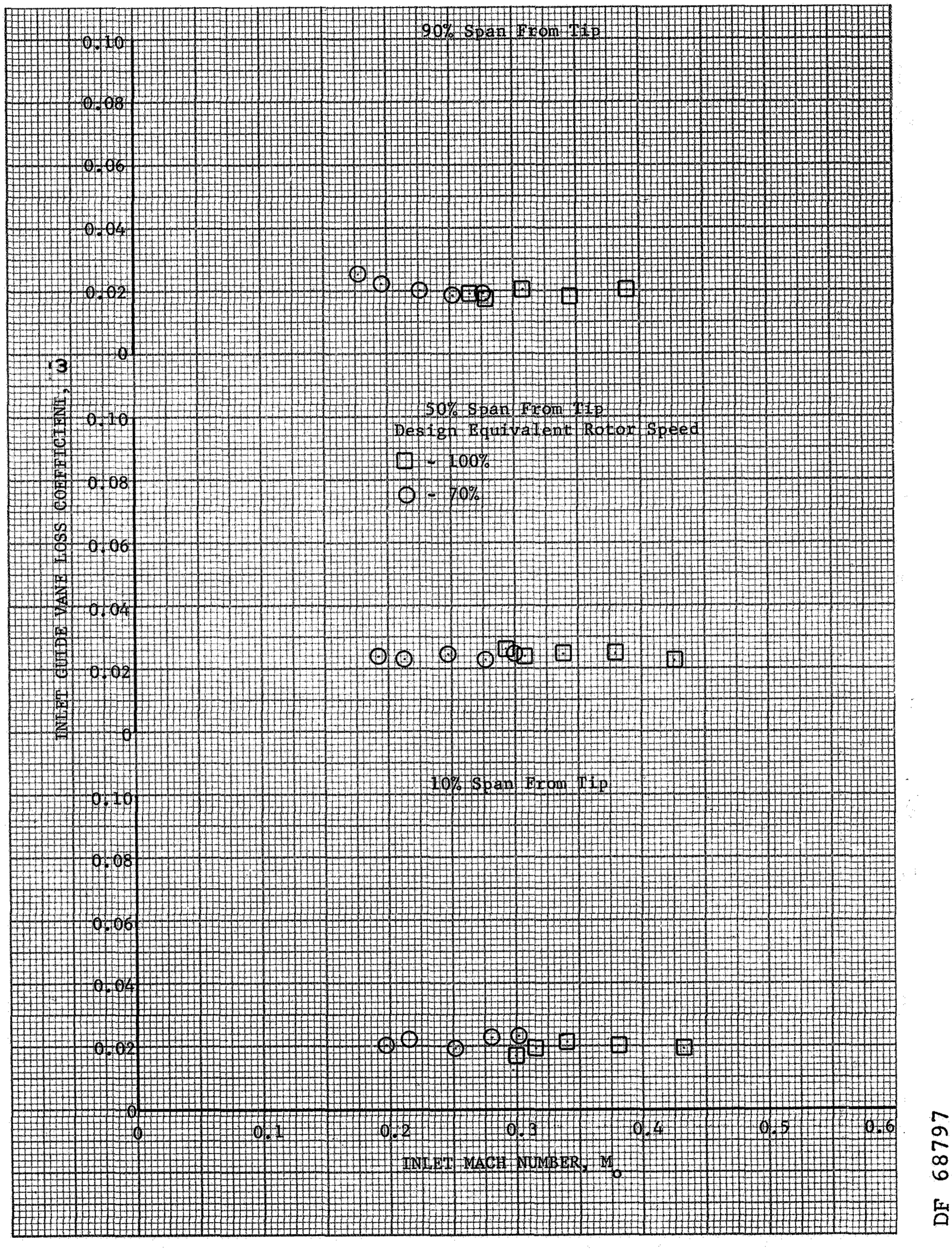



Figure 57. Inlet Guide Vane Loss Coefficient vs Inlet Mach Number: Intermediate Configuration

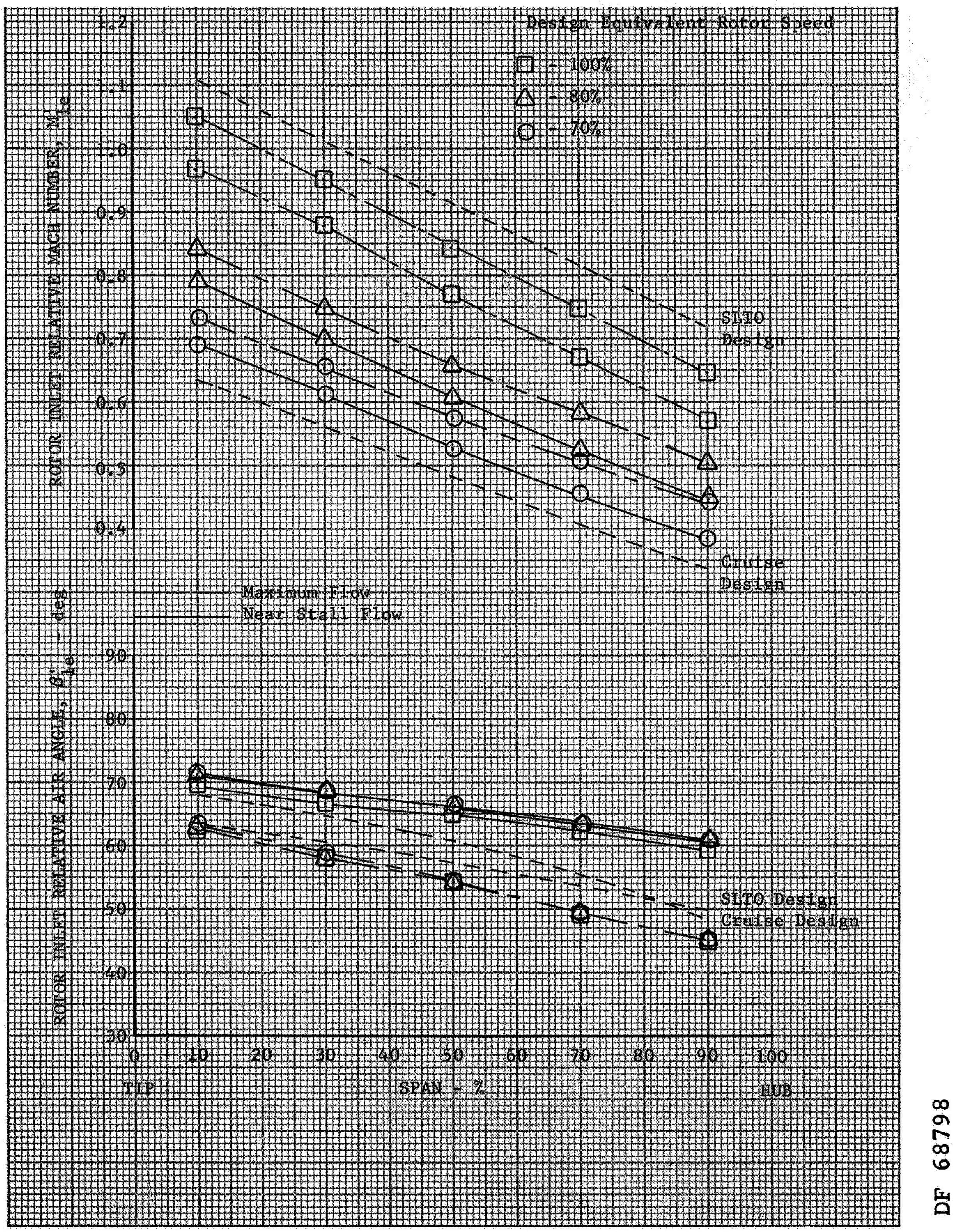



Figure 58. Rotor Inlet Relative Air Angle and Mach Number Distribution: Intermediate Configuration

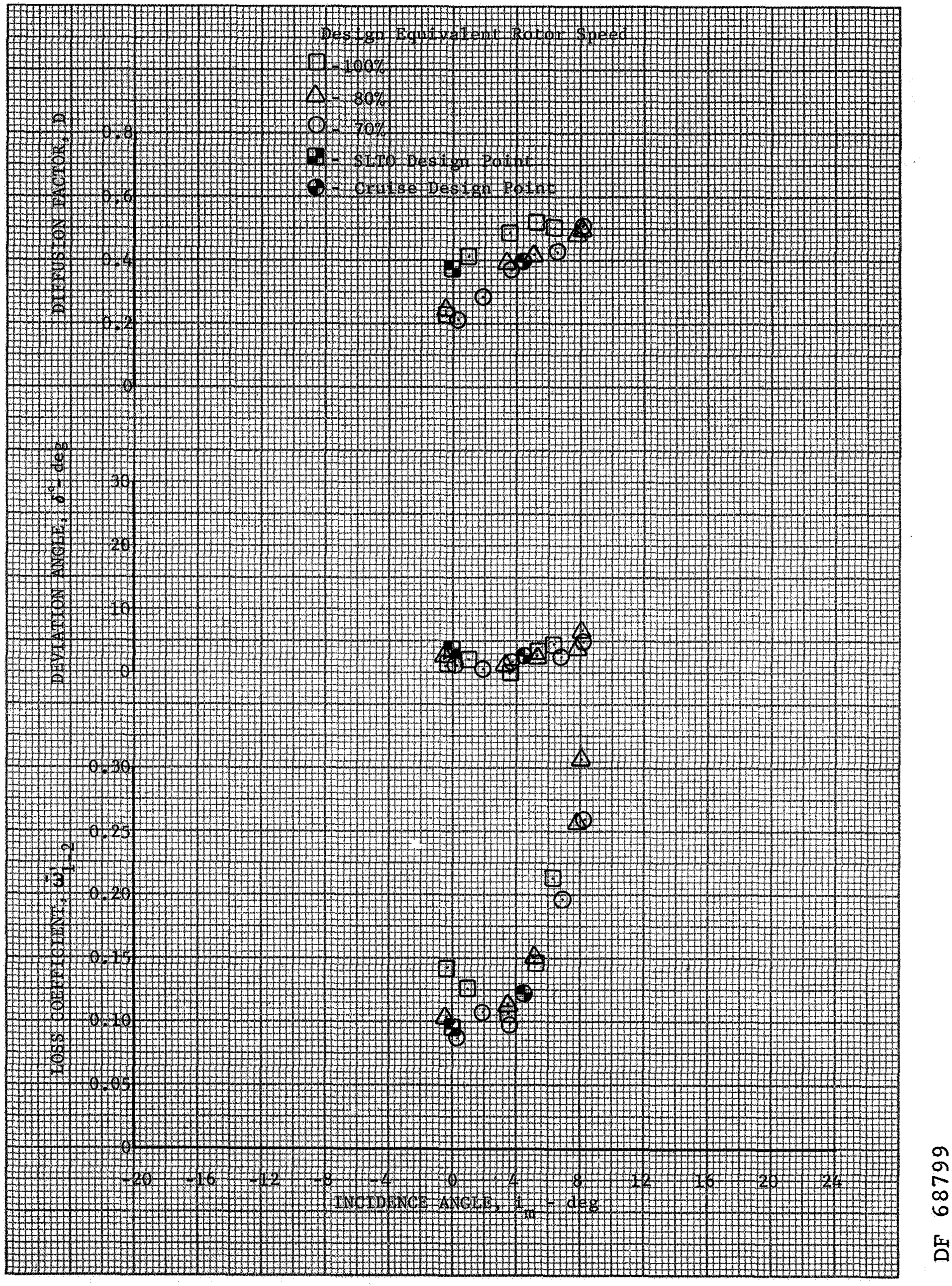
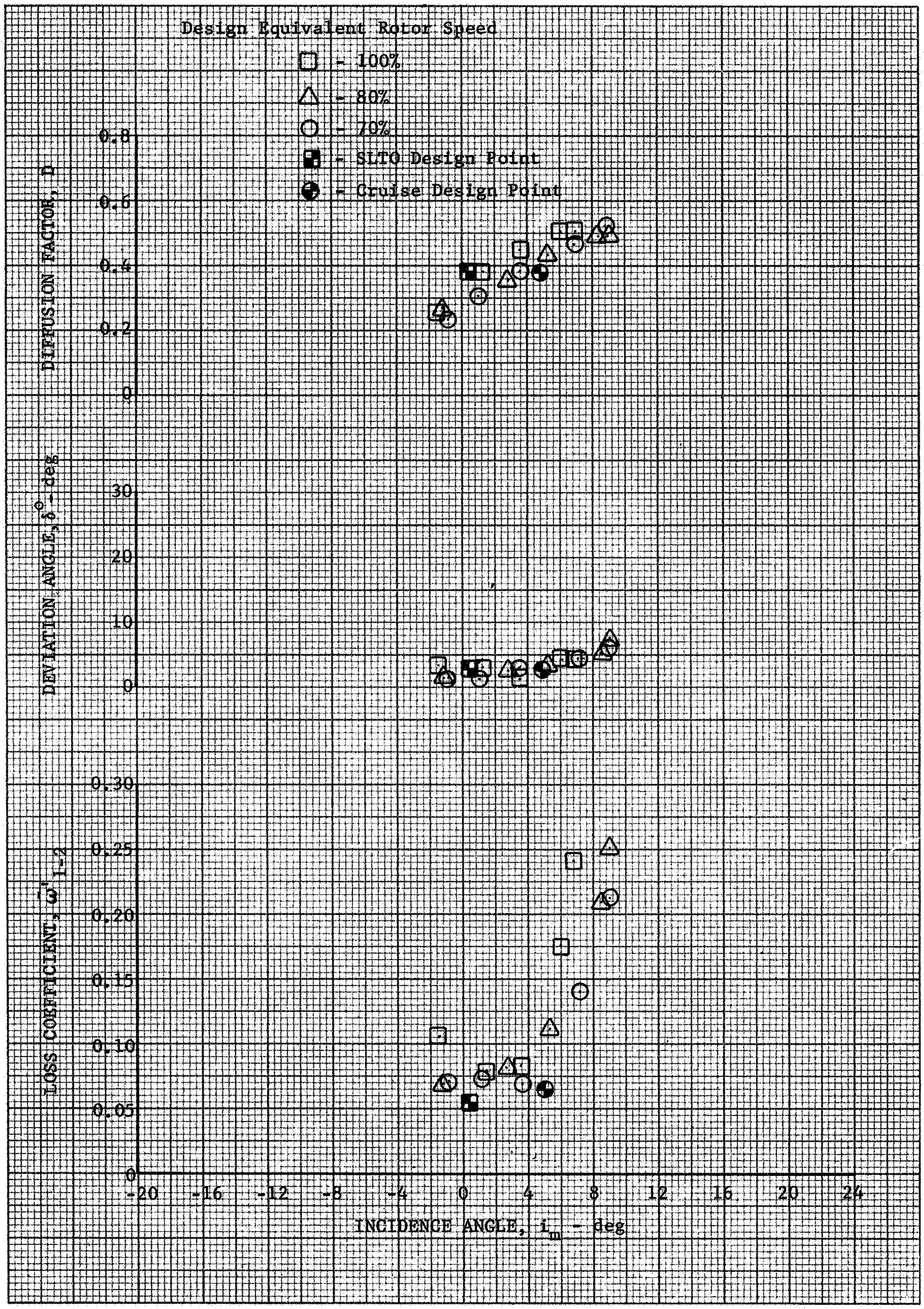



Figure 59. Rotor Blade Element Performance: Intermediate Configuration, 10% Span From Tip




DF 68941

Figure 60. Rotor Blade Element Performance: Intermediate Configuration, 30% Span From Tip

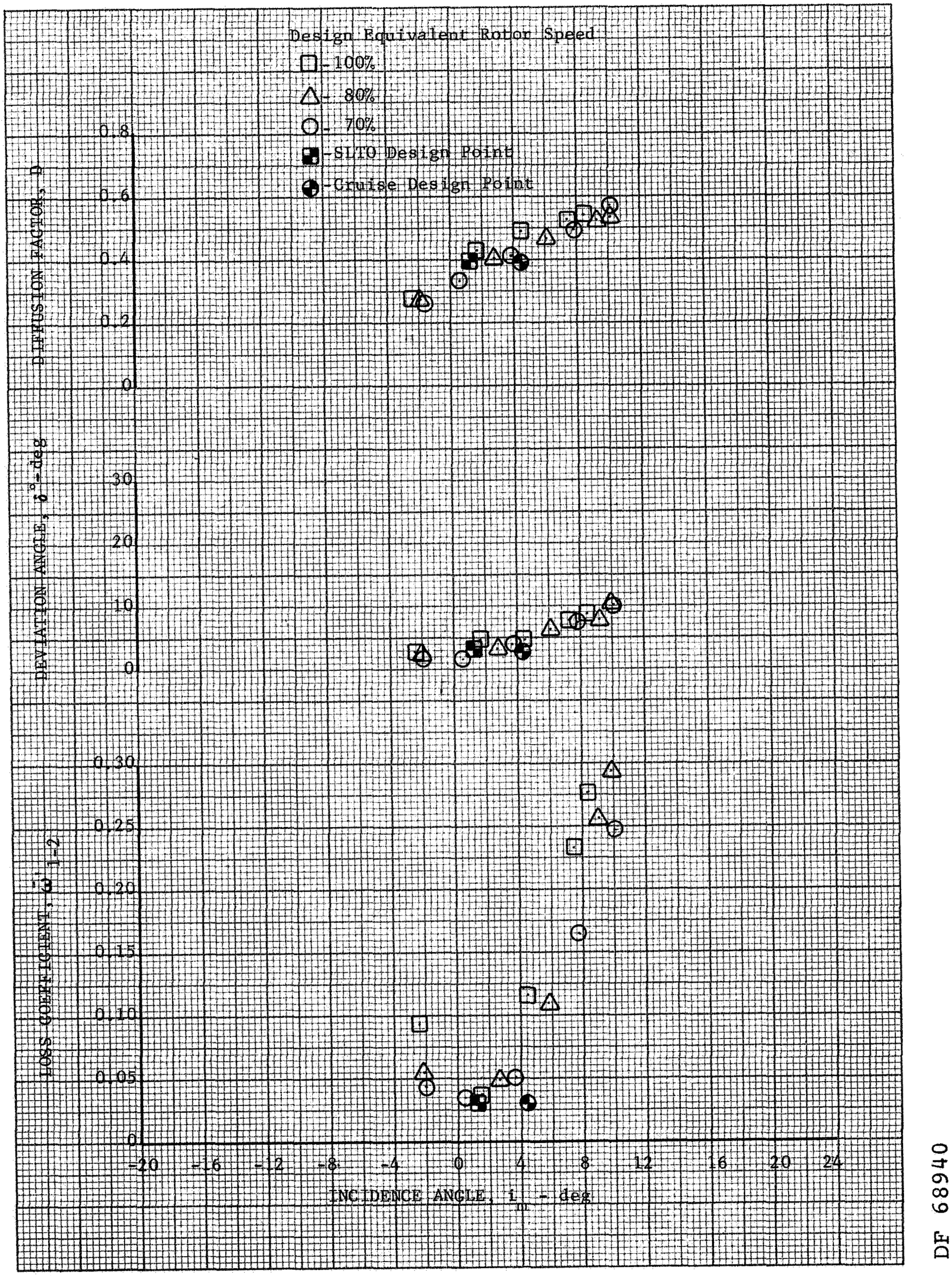



Figure 61. Rotor Blade Element Performance: Intermediate Configuration, 50% Span From Tip

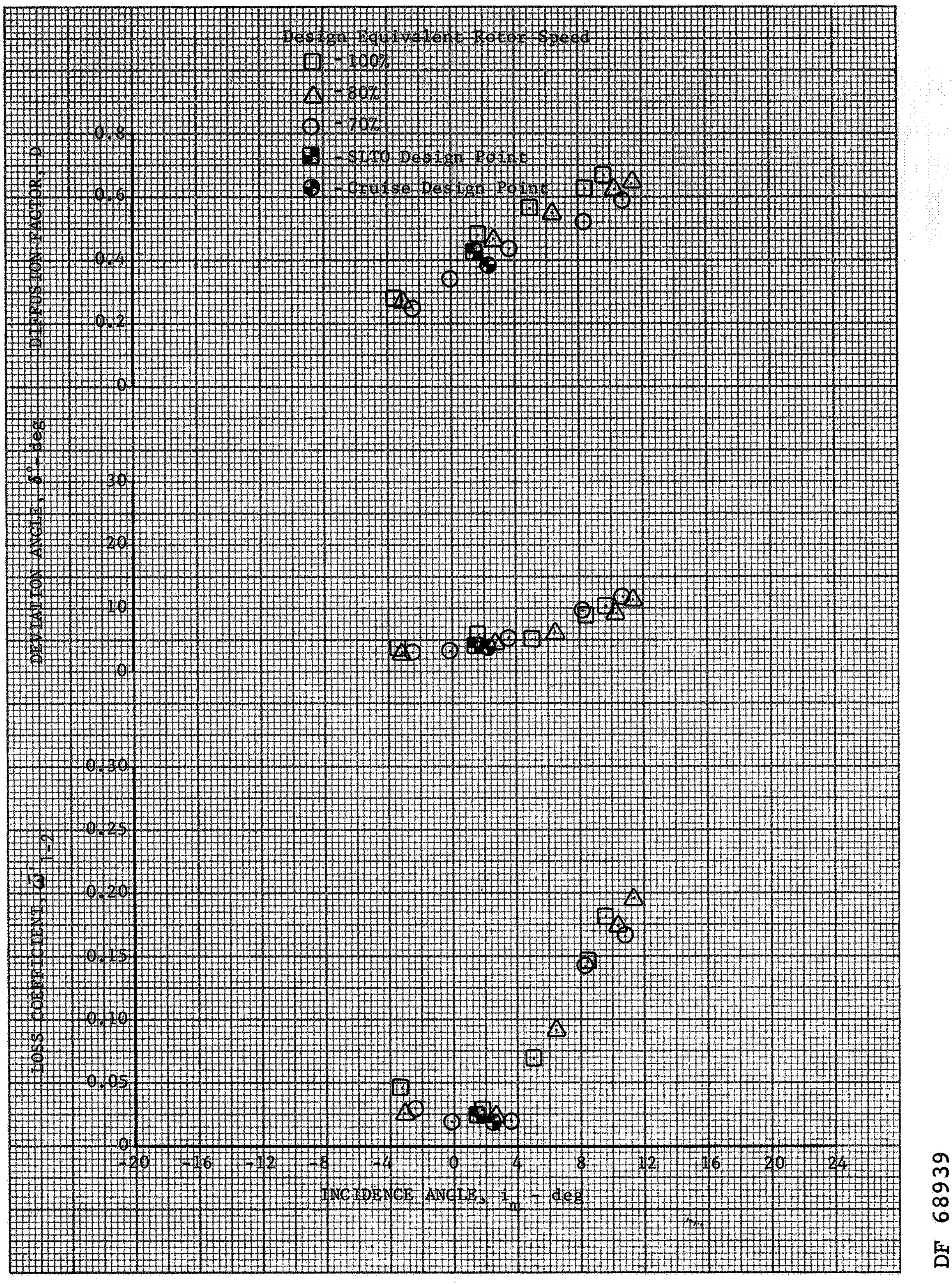



Figure 62. Rotor Blade Element Performance: Intermediate Configuration, 70% Span From Tip

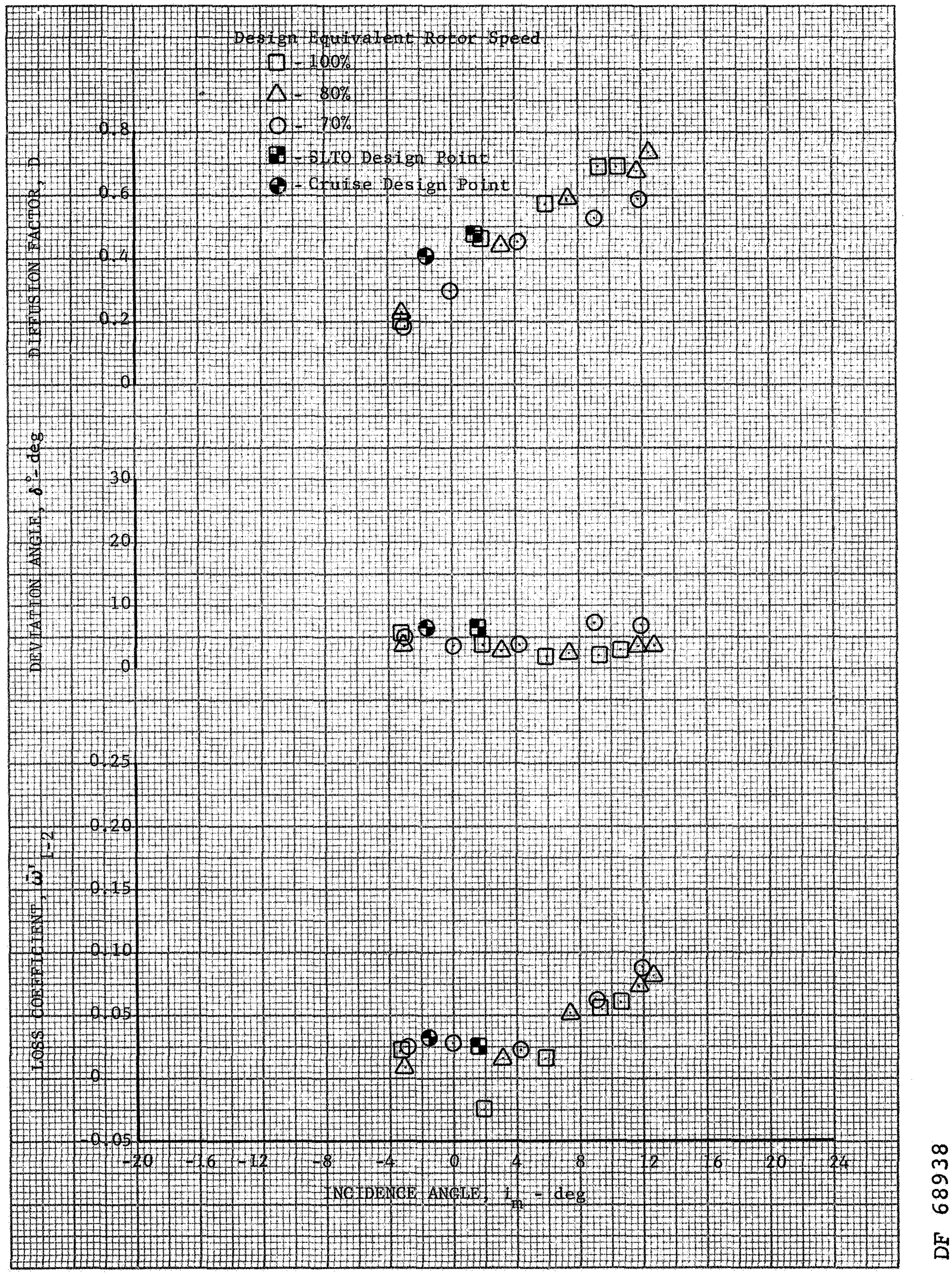
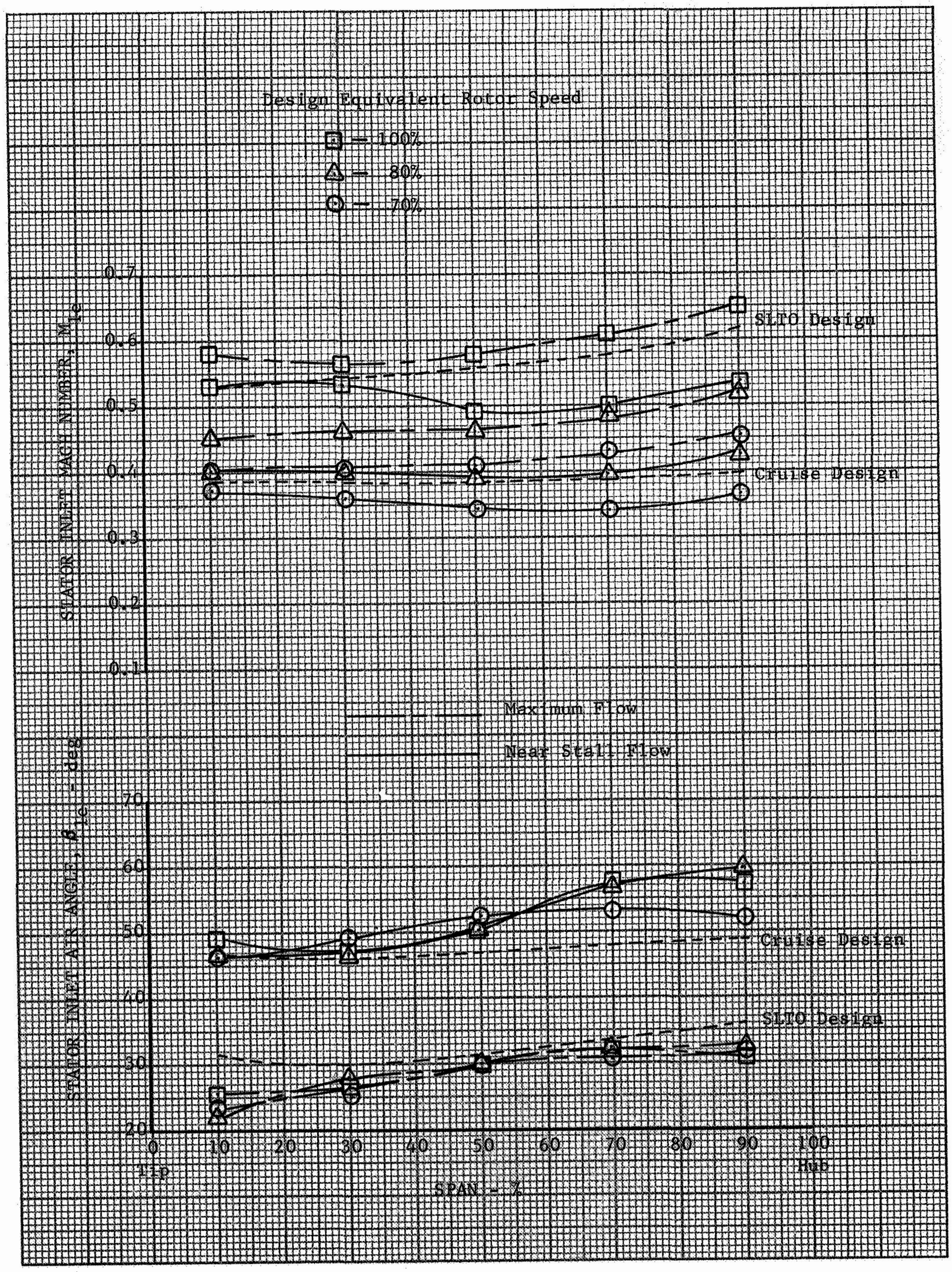
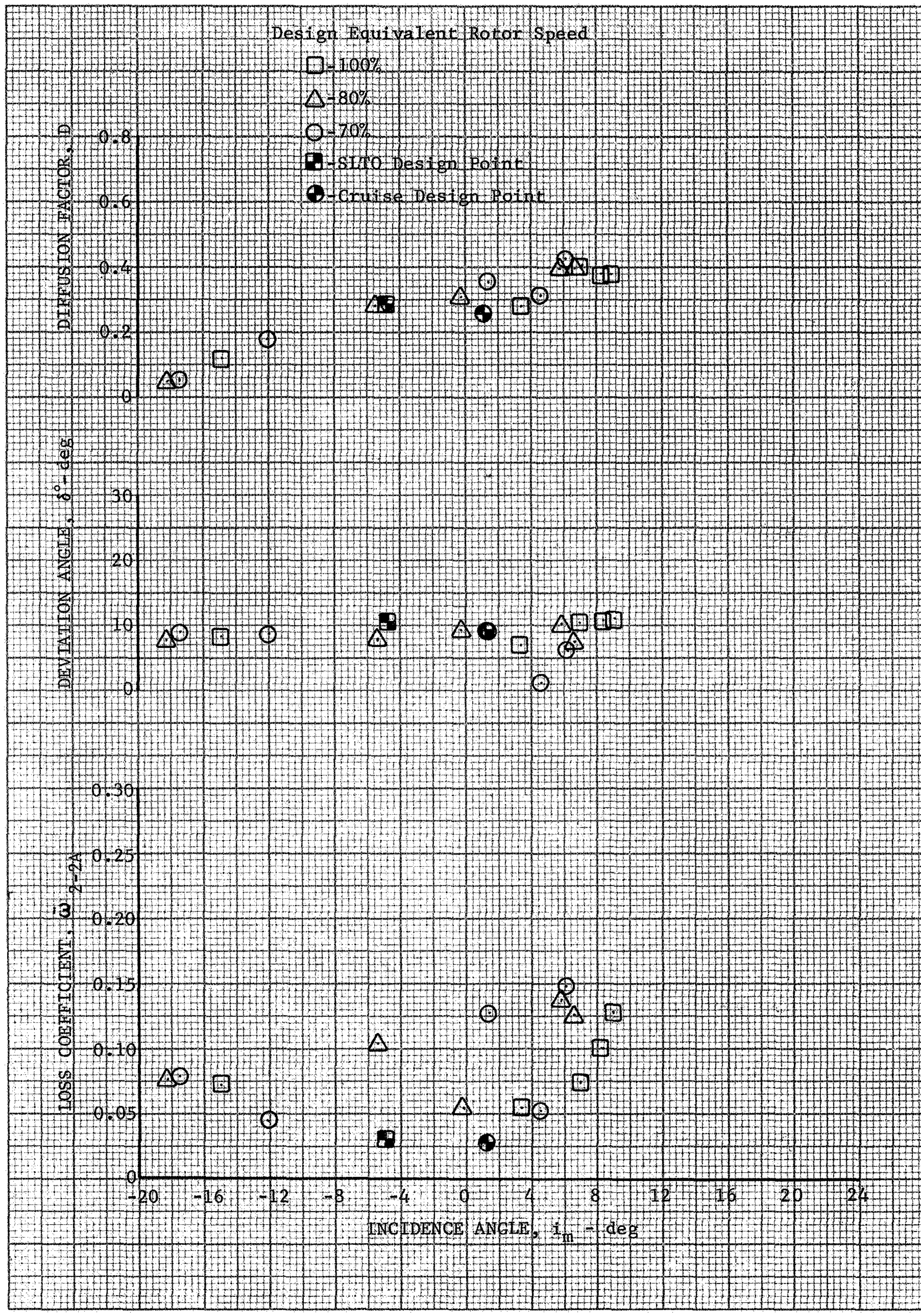



Figure 63. Rotor Blade Element Performance: Intermediate Configuration, 90% Span From Tip




DF 68937

Figure 64. Stator Inlet Air Angle and Mach Number Distribution: Intermediate Configuration




DF 68936

Figure 65. Stator Blade Element Performance: Intermediate Configuration, 10% Span From Tip

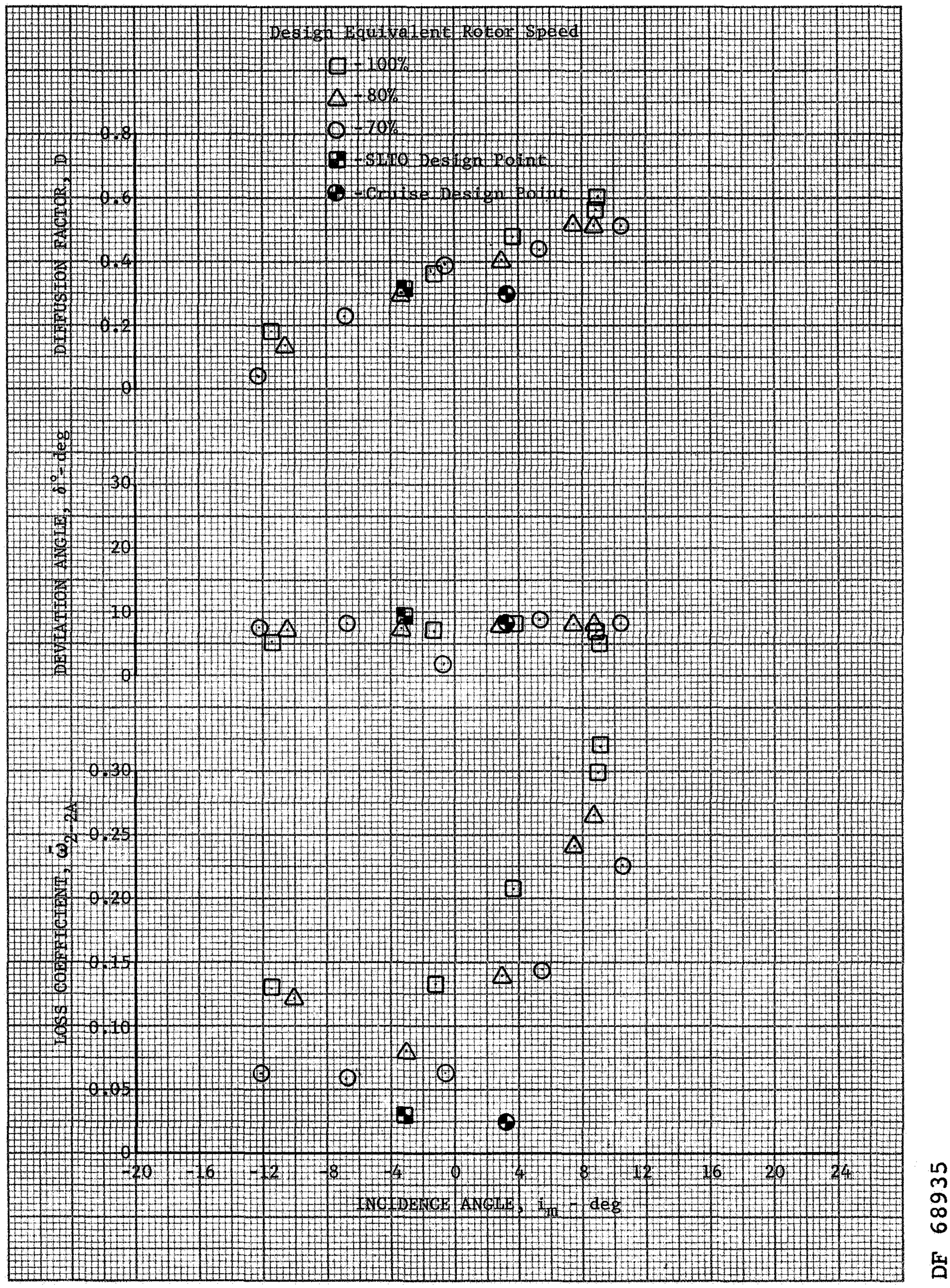
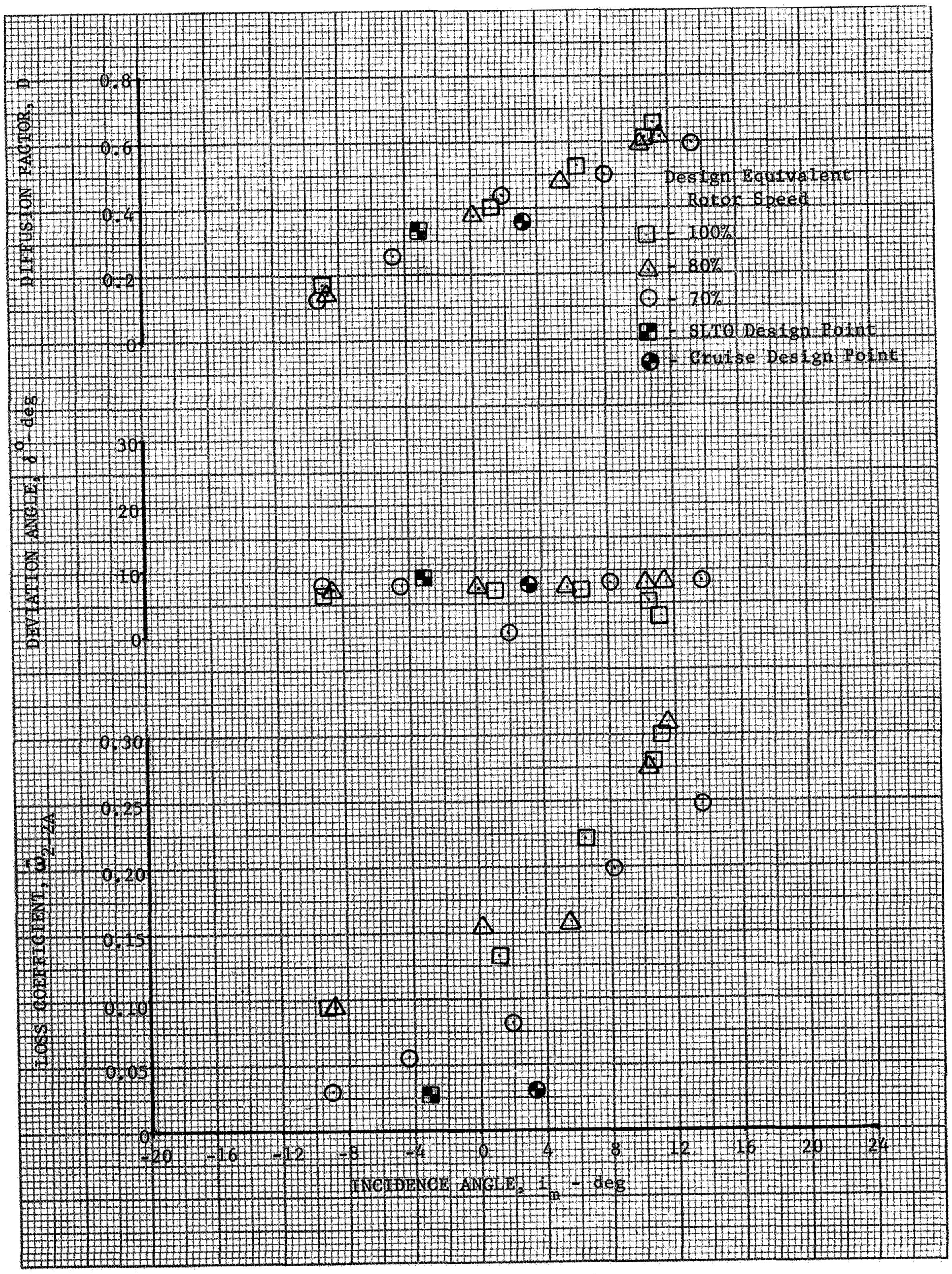
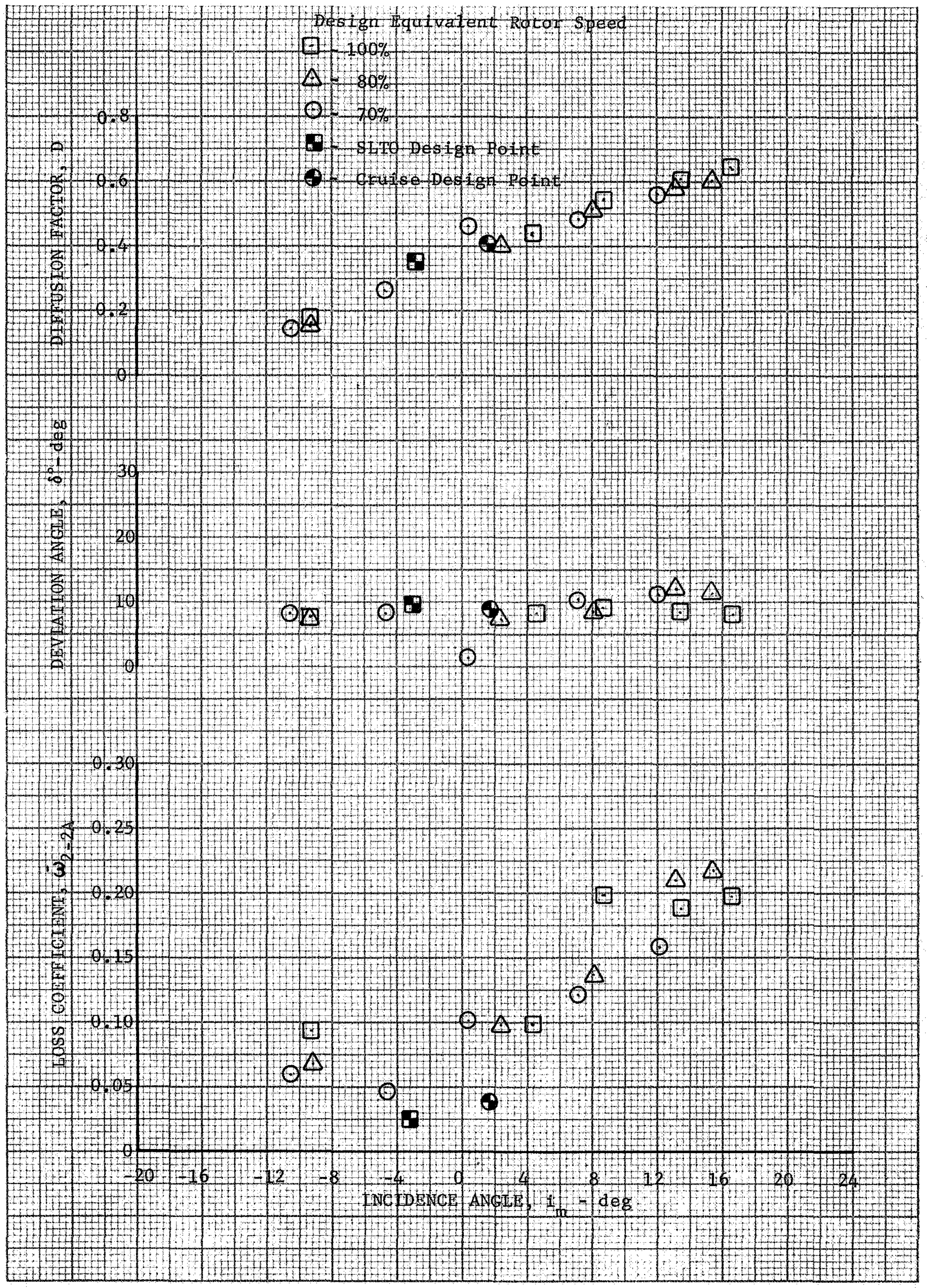



Figure 66. Stator Blade Element Performance: Intermediate Configuration, 30% Span From Tip




DF 68942

Figure 67. Stator Blade Element Performance: Intermediate Configuration, 50% Span From Tip




DF 68808

Figure 68. Stator Blade Element Performance: Intermediate Configuration, 70% Span From Tip

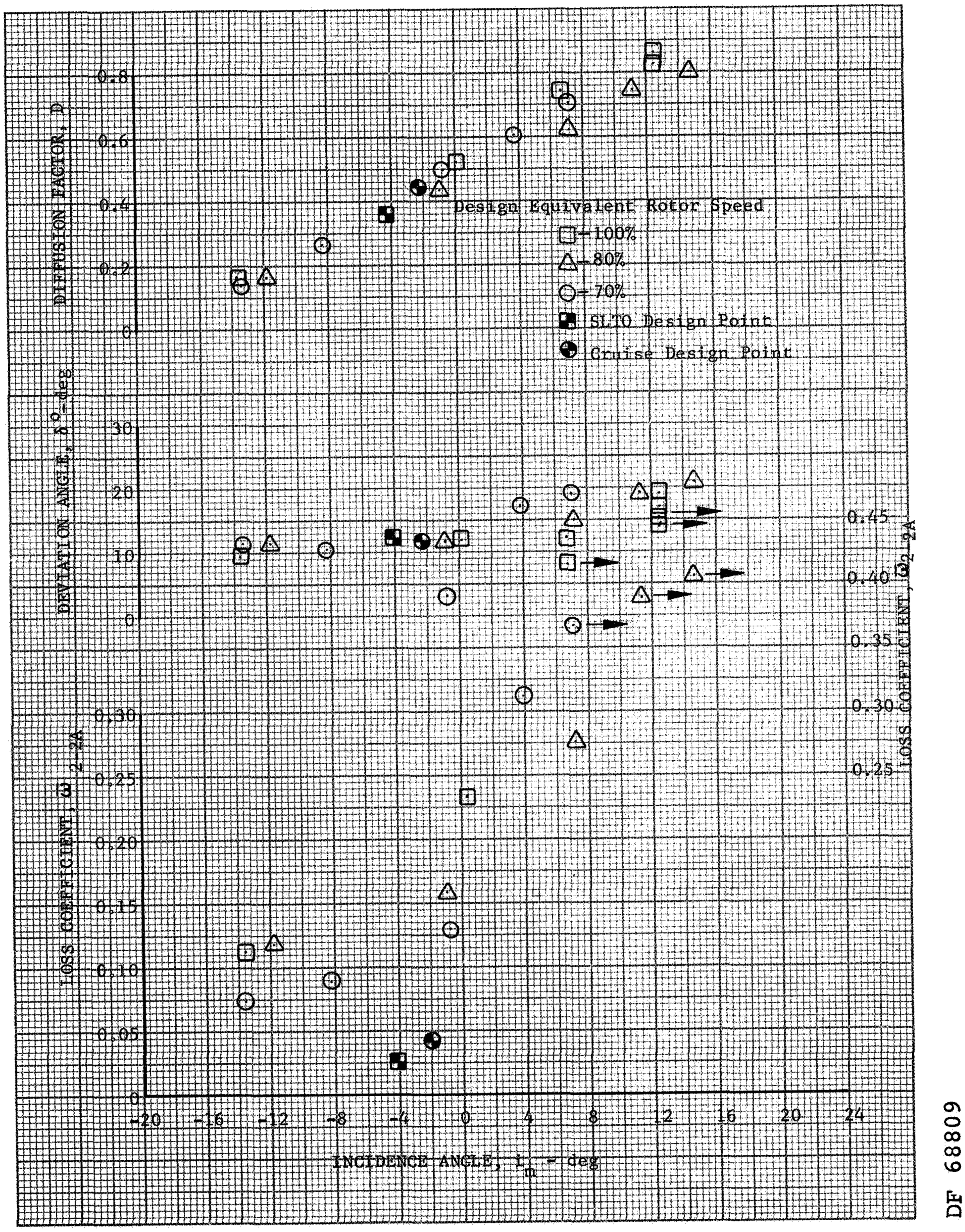



Figure 69. Stator Blade Element Performance: Intermediate Configuration, 90% Span From Tip

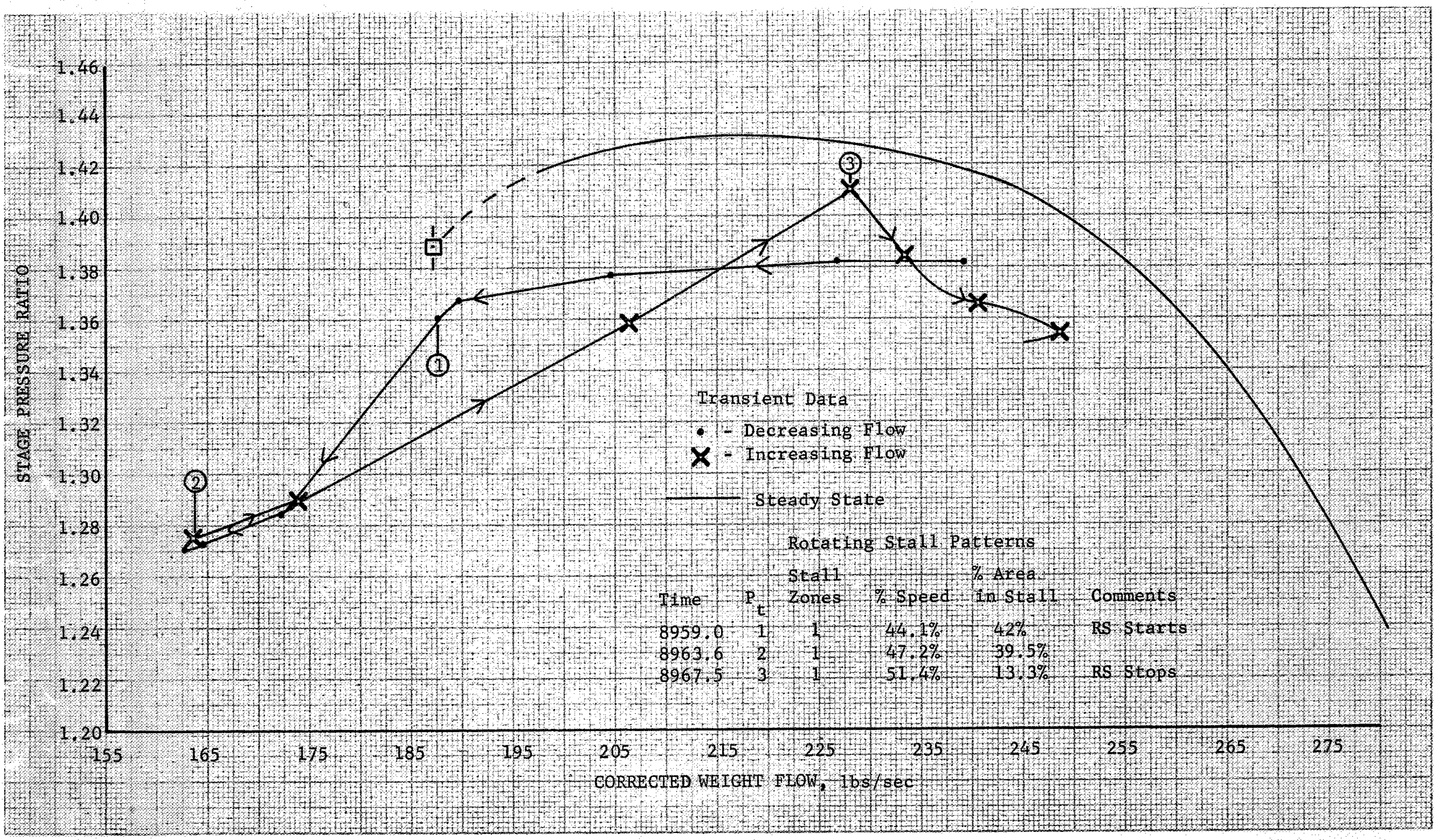
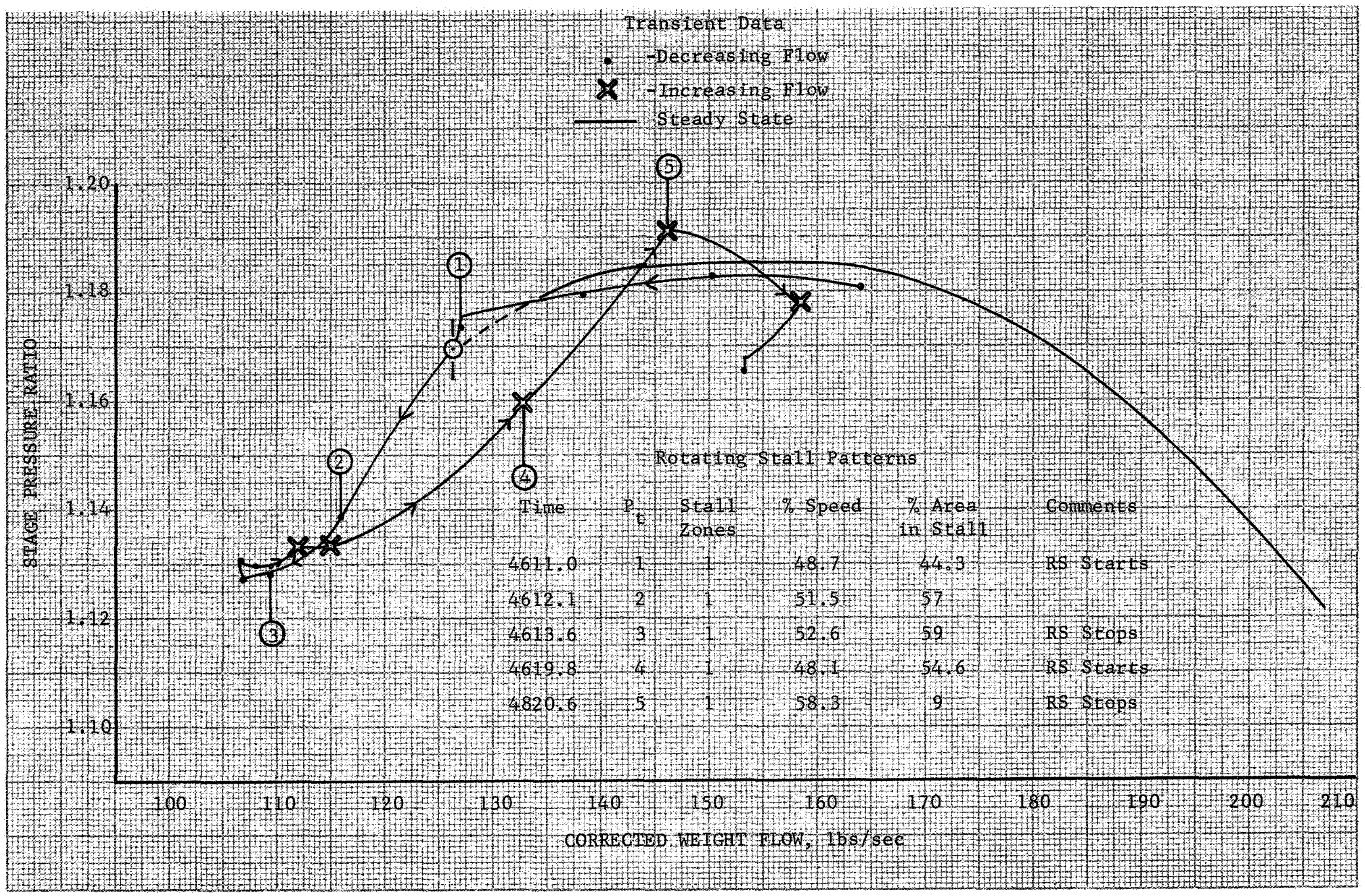



Figure 70. Transient Stall Data: SLTO Configuration, 100% Design Equivalent Rotor Speed




| Time | $P_t$ | Stall Zones | % Speed | % Area in Stall | Comments |
|---|---|---|---|---|---|
| 4611.0 | 1 | 1 | 48.7 | 44.3 | RS Starts |
| 4612.1 | 2 | 1 | 51.5 | 57 | |
| 4613.6 | 3 | 1 | 52.6 | 59 | RS Stops |
| 4619.8 | 4 | 1 | 48.1 | 54.6 | RS Starts |
| 4820.6 | 5 | 1 | 58.3 | 9 | RS Stops |

Figure 71. Transient Stall Data: SLTO Configuration, 70% Design Equivalent Rotor Speed

DF 68811

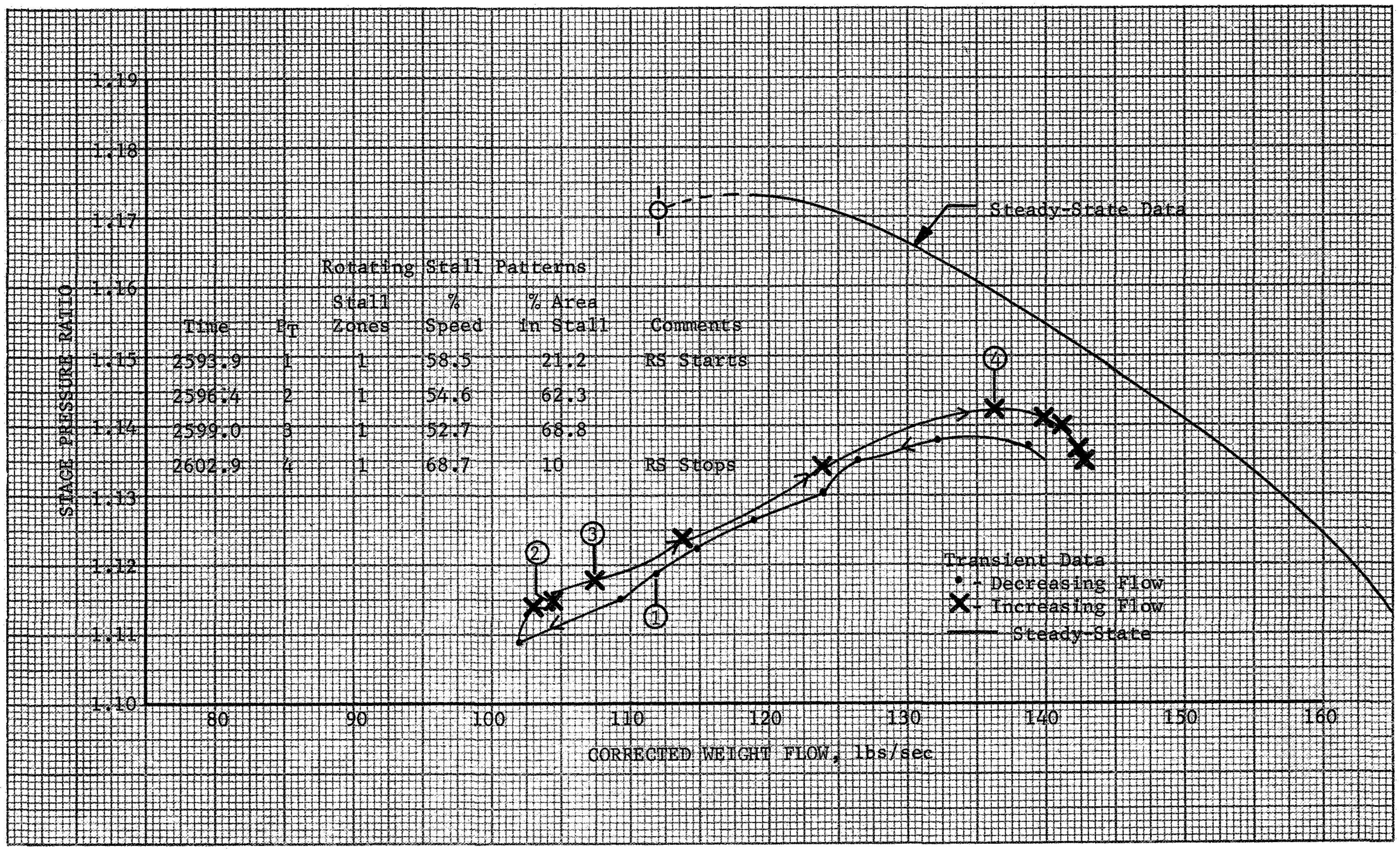



Figure 72. Transient Stall Data: Cruise Configuration, 70% Design Equivalent Rotor Speed

DF 68812

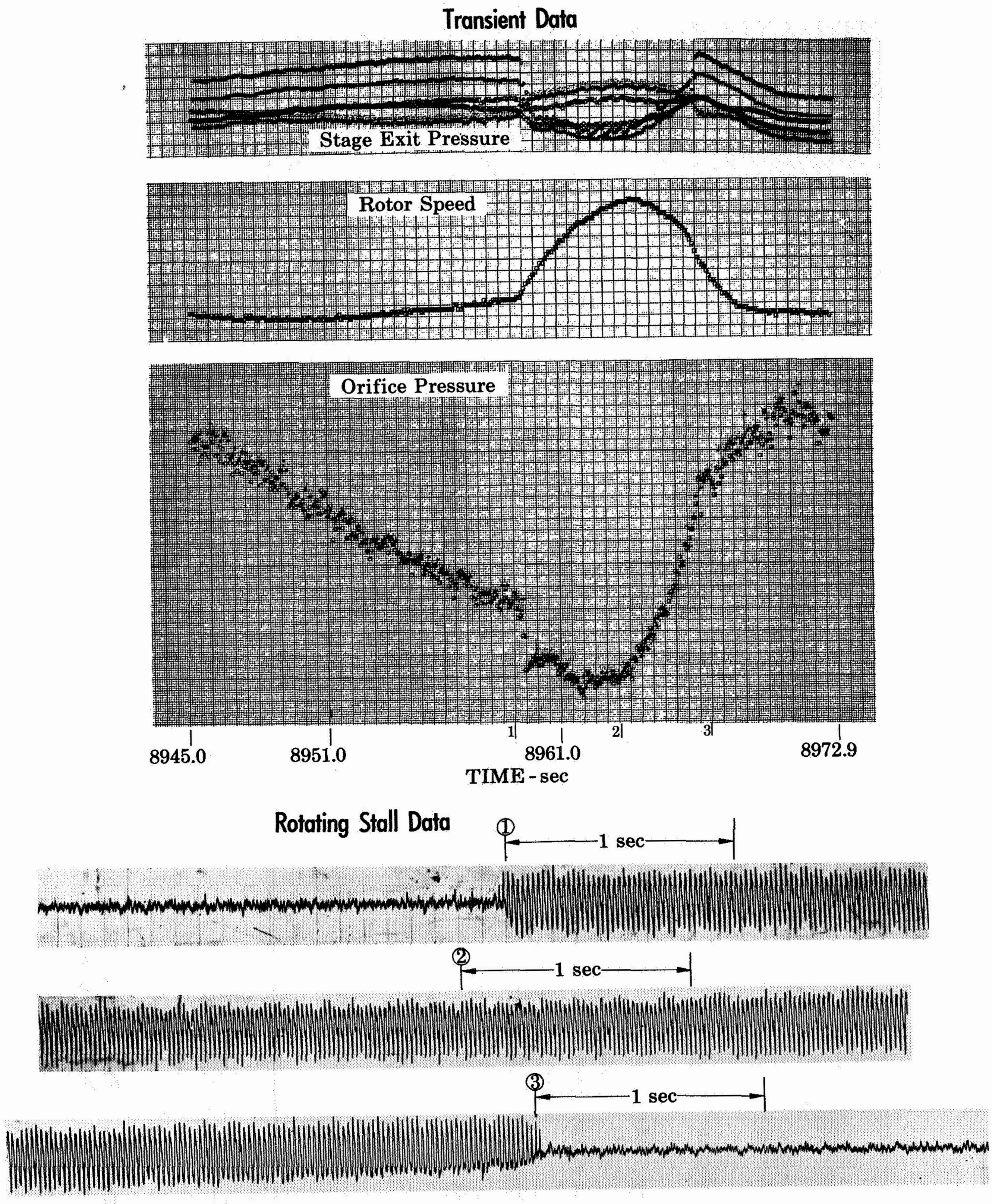



Figure 73. Transient and Rotating Stall (Kistler Trace) Data FD 25734

APPENDIX A
DEFINITION OF SYMBOLS

| | |
|---|---|
| $A_A$ | Flowpath annular area, $in.^2$ |
| $a'_{0_1}$ | Inlet relative stagnation velocity of sound, ft/sec |
| c | Chord length, in. |
| $C_p$ | Specific heat of air, 0.24 Btu/lb$^{\circ}$F |
| d | Diameter |
| D | Diffusion factor |
| g | Gravitational constant, 32.2 ft/sec$^2$ |
| $i_m$ | Incidence angle, deg (based on equivalent circular arc for stators) |
| J | Mechanical equivalent of heat, 778 ft-lb/Btu |
| $\overline{m}$ | Mass flow parameter, $\sqrt{\gamma g/_R}\ M \left[1 + \frac{\gamma-1}{2} M^2\right]^{1/2} p/P$ |
| M | Absolute Mach number |
| P | Total pressure, psia |
| p | Static pressure, psia |
| q | Pressure equivalent of the velocity head, psia |
| R | Gas constant for air, 53.3 $\frac{ft\text{-}lbs}{lb\text{-}^{\circ}R}$ |
| S | Blade spacing, in. |
| s | Blade span, in. |
| T | Total temperature, $^{\circ}$R |
| $T_s$ | Static temperature, $^{\circ}$R |
| t | Blade maximum thickness, in. |
| U | Rotor speed, ft/sec |
| V | Absolute velocity, ft/sec |
| W | Actual flow rate, $lb_m$/sec |
| $\beta$ | Absolute air angle, deg |
| $\gamma$ | Ratio of specific heats |

| | |
|---|---|
| $\gamma^o$ | Blade-Chord angle, deg |
| $\delta$ | Ratio of total pressure to NASA standard sea level pressure of 2116 psf |
| $\delta^o$ | Deviation angle, deg |
| $\eta_{ad}$ | Adiabatic efficiency |
| $\eta_p$ | Polytropic Efficiency |
| $\theta$ | Ratio of total temperature to NASA standard sea level temperature of 518.7$^o$R |
| $\kappa$ | Blade metal angle, deg (based on equivalent circular arc for stators) |
| $\rho$ | Density, $lb_m/ft^3$ |
| $\sigma$ | Solidity, c/S |
| $\phi$ | Blade camber angle, deg (based on equivalent circular arc for stator B and on the 0.5% chord and 95% chord for the IGV) |
| $\psi$ | Pressure rise coefficient |
| $\bar{\omega}$ | Total pressure loss coefficient |

Subscripts

| | |
|---|---|
| 0 | Compressor inlet instrumentation station |
| 1 | Guide vane exit/rotor inlet instrumentation station |
| 2 | Rotor exit/stator inlet instrumentation station |
| 2A | Stator exit instrumentation station |
| fs | Freestream value of guide vane or stator rake total pressure |
| id | Isentropic condition |
| le | Leading edge |
| te | Trailing edge |
| m | Midspan |
| s | Static condition |
| z | Axial component |
| $\theta$ | Tangential component |

Superscripts

| | |
|---|---|
| ' | Relative rotor blade |
| – | Mass average value (used for overall and blade element performance) |

Nomenclature used for blade element data tabulation (tables B-2, B-3, and B-4)

| | |
|---|---|
| PCT SPAN | Percent Span |
| DIA | Diameter, inches |
| BETA | Absolute air angle, degrees |
| BETA (PR) | Relative air angle, degrees |
| V | Absolute velocity, ft/sec |
| VZ | Axial component of velocity, ft/sec |
| V-THETA | Tangential component of absolute velocity, ft/sec |
| V(PR) | Relative velocity, ft/sec |
| V-THETA PR | Tangential component of relative velocity, ft/sec |
| U | Wheel speed, ft/sec |
| M | Absolute Mach number |
| M(PR) | Relative Mach number |
| TURN | Air Turning, degrees |
| TURN (PR) | Relative air turning, degrees |
| $\bar{\omega}$ | Loss coefficient |
| DFAC | Diffusion factor |
| EFFP | Polytropic efficiency |
| EFF | Adiabatic efficiency |
| INCIDM | Incidence, degrees |
| DEVM | Deviation, degrees |

NOTE

The numbers following the nomenclature in Tables B-2, B-3, and B-4 refer to the leading and trailing edges of the respective blade rows, as indicated below:

| | |
|---|---|
| 3 | $IGV_{le}$ |
| 4 | $IGV_{te}$ |
| 6 | $Rotor_{le}$ |
| 7 | $Rotor_{te}$ |
| 9 | $Stator_{le}$ |
| 10 | $Stator_{te}$ |

## DEFINITION OF CALCULATED PERFORMANCE VARIABLES

### Overall Performance Data

Inlet Mach Number:

$$\frac{W\sqrt{\theta}\sqrt{518.7}}{\delta P_o A_o} = g\sqrt{\gamma/g}\, M_o \left[ 1 + \frac{\gamma - 1}{2} M_o^2 \right]^{1/2}$$

Pressure Ratio:

Rotor: $\dfrac{\overline{P}_2}{\overline{P}_1}$ Rotor-Guide Vane: $\dfrac{\overline{P}_2}{14.696}$ Stage: $\dfrac{\overline{P}_{2A}}{14.696}$

Corrected Flow

$W\sqrt{\theta}/\delta$

Corrected Specific Flow:

$\dfrac{W\sqrt{\theta}}{\delta A_A}$

Corrected Rotor Speed:

$N/\sqrt{\theta}$

Adiabatic Efficiency (overall):

$$\eta_{ad} = \frac{(\overline{P}_2/\overline{P}_1)^{\frac{\gamma-1}{\gamma}} - 1}{\overline{T}_{2A}/\overline{T}_1 - 1} \text{ (e.g., for rotor)}$$

Pressure Rise Coefficient:

$$\psi = \frac{C_p J g T_o \left[ (\overline{P}_{2A}/P_o)^{\frac{\gamma - 1}{\gamma}} - 1 \right]}{U^2{}_{1e_m}\Big|_{rotor}}$$

Flow Coefficient:

$$\phi = V_{z1e_m}/U_{1e_m} \text{ rotor}$$

## Blade Element Data

Incidence Angle:

$$i_m = \beta_{le} - \kappa_{le}$$

Diffusion Factor:

$$\text{Rotor:} \quad D = 1 - \frac{V'_{te}}{V'_{le}} + \left( \frac{d_{te}V_{\theta te} - d_{le}V_{\theta le}}{(d_{le} + d_{te})\sigma V'_{le}} \right)$$

$$\text{Stator:} \quad D = 1 - \frac{V_{te}}{V_{le}} + \left( \frac{d_{le}V_{\theta le} - d_{te}V_{\theta te}}{(d_{le} + d_{te})\sigma V_{le}} \right)$$

Deviation Angle:

$$\delta^o = \beta_{te} - \kappa_{te}$$

Loss Coefficient:

$$\text{IGV:} \quad \bar{\omega} = \frac{P_{fs} - \bar{P}_1}{P_{fs} - P_o}$$

($p_o$ was found from linear interpolation of inner and outer wall static pressures at Station 0.)

$$\text{Rotor:} \quad \bar{\omega} = \frac{\bar{P}'_{2id} - P'_2}{\bar{P}'_1 - p_1}$$

where:

$$P'_{2id} = P'_1 \left\{ 1 + \frac{\gamma - 1}{2} \left( \frac{U_{te}^{\,2}}{a'^{\,2}_{0_1}} \right) \left[ 1 - \left( \frac{d_{le}}{d_{te}} \right)^2 \right] \right\}^{\frac{\gamma}{\gamma - 1}}$$

$P'$ is found from $p/P' = \left[ 1 + \frac{\gamma - 1}{2} M'^2 \right]^{\frac{\gamma}{\gamma - 1}}$

and $M'$ is calculated using trigonometric functions and the measurements of $U$, $\beta$, $P$, and $p$.

$$\text{Stator:} \quad \bar{\omega} = \frac{P_{fs} - \bar{P}_{2a}}{P_{fs} - P_2}$$

Adiabatic Efficiency:

$$\text{Rotor:} \quad \frac{\left[(P_{te}/\overline{P}_{le})^{\frac{\gamma-1}{\gamma}} - 1\right]}{T_{te}/T_o - 1}$$

Polytropic Efficiency:

$$\text{IGV:} \quad \eta_p = \frac{\ln\left(T_{s_{le}}/T_{s_{te}}\right)}{\frac{\gamma-1}{\gamma} \ln P_{le}/P_{te}}$$

$$\text{Rotor:} \quad \eta_p = \frac{\frac{\gamma-1}{\gamma} \ln (P_{te}/P_{le})}{\ln T_{te}/T_o}$$

$$\text{Stator:} \quad \eta_p = \frac{\frac{\gamma-1}{\gamma} \ln (P_{te}/P_{le})}{\ln T_{s_{te}}/T_{s_{le}}}$$

# APPENDIX B

## TABULATED PERFORMANCE

The stage overall performance, rotor performance, and corrected weight flow for each test point are presented in table B-1.

Tables B-2 and B-3, respectively, present SLTO and cruise configuration blade element data for each test point. Table B-4 presents blade element data for the intermediate configuration.* Definition of the blade element velocity triangle and performance variables as tabulated in the computer printout is given in Appendix A.

*At 110% of design rotor speed for the SLTO configuration, three data points were omitted from the data presentation because of questionable plenum pressure data.

Table B-1. Overall Performance
SLTO Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor | | | Guide Vane Rotor | | | Stage | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\overline{P}_2/\overline{P}_1$ | $\eta_{ad}$% | $\eta_p$% | $\overline{P}_2/P_0$ | $\eta_{ad}$% | $\eta_p$% | $\overline{P}_{2A}/P_o$ | $\eta_{ad}$% | $\eta_p$% |
| 50% Design Equivalent Rotor Speed | | | | | | | | | | |
| 147 | 92.57 | 1.0980 | 86.12 | 86.4 | 1.0978 | 85.95 | 86.2 | 1.0862 | 76.04 | 76.3 |
| 148 | 100.76 | 1.0943 | 89.47 | 89.7 | 1.0941 | 89.25 | 89.6 | 1.0876 | 83.32 | 83.5 |
| 149 | 106.95 | 1.0938 | 86.64 | 86.9 | 1.0937 | 86.53 | 86.7 | 1.0908 | 83.97 | 84.2 |
| 150 | 121.23 | 1.0877 | 106.52 | ---- | 1.0874 | 106.09 | ---- | 1.0858 | 104.20 | ---- |
| 151 | 133.18 | 1.0781 | 96.45 | 96.6 | 1.0778 | 96.18 | 96.3 | 1.0768 | 95.00 | 95.1 |
| 146 | 149.44 | 1.0650 | 94.81 | 94.9 | 1.0643 | 93.76 | 93.8 | 1.0608 | 88.78 | 88.9 |
| 70% Design Equivalent Rotor Speed | | | | | | | | | | |
| 140 | 133.86 | 1.1959 | 85.74 | 86.1 | 1.1953 | 85.47 | 85.8 | 1.1783 | 78.44 | 78.9 |
| 141 | 140.30 | 1.1951 | 85.48 | 85.9 | 1.1945 | 85.23 | 85.6 | 1.1831 | 80.55 | 81.0 |
| 142 | 151.31 | 1.1918 | 90.40 | 90.7 | 1.1908 | 89.96 | 90.3 | 1.1844 | 87.11 | 87.4 |
| 143 | 171.33 | 1.1893 | 98.07 | 98.2 | 1.1877 | 97.29 | 97.4 | 1.1809 | 93.99 | 94.1 |
| 144 | 187.25 | 1.1657 | 96.66 | 96.8 | 1.1641 | 95.39 | 95.5 | 1.1607 | 93.53 | 93.7 |
| 139 | 207.02 | 1.1329 | 99.83 | 99.9 | 1.1311 | 98.55 | 98.6 | 1.1217 | 91.79 | 91.9 |

Table B-1. Overall Performance (Continued)
SLTO Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor | | | Guide Vane Rotor | | | Stage | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{P}_2/\bar{P}_1$ | $\eta_{ad}\%$ | $\eta_p\%$ | $\bar{P}_2/P_0$ | $\eta_{ad}\%$ | $\eta_p\%$ | $\bar{P}_{2A}/P_0$ | $\eta_{ad}\%$ | $\eta_p\%$ |
| 80% Design Equivalent Rotor Speed | | | | | | | | | | |
| 137 | 157.40 | 1.2581 | 82.32 | 82.9 | 1.2569 | 81.97 | 82.6 | 1.2379 | 76.34 | 77.1 |
| 133 | 164.03 | 1.2647 | 92.59 | 92.9 | 1.2652 | 92.75 | 93.0 | 1.2495 | 87.67 | 88.1 |
| 134 | 176.83 | 1.2534 | 89.95 | 90.3 | 1.2507 | 89.05 | 89.5 | 1.2524 | 89.63 | 90.0 |
| 135 | 198.66 | 1.2521 | 89.61 | 90.0 | 1.2516 | 89.46 | 89.9 | 1.2527 | 89.80 | 90.1 |
| 136 | 222.84 | 1.2107 | 96.58 | 96.7 | 1.2098 | 96.12 | 96.3 | 1.2073 | 95.05 | 95.2 |
| 132 | 238.36 | 1.1800 | 102.18 | ---- | 1.1748 | 99.35 | 99.4 | 1.1599 | 91.33 | 91.5 |
| 100% Design Equivalent Rotor Speed | | | | | | | | | | |
| 154 | 197.35 | 1.4423 | 82.90 | 83.8 | 1.4440 | 83.18 | 84.1 | 1.4194 | 79.09 | 80.1 |
| 155 | 209.34 | 1.4416 | 87.23 | 87.9 | 1.4437 | 87.60 | 88.2 | 1.4301 | 85.24 | 86.0 |
| 156 | 224.10 | 1.4252 | 89.34 | 89.9 | 1.4237 | 89.07 | 89.7 | 1.4312 | 90.45 | 90.9 |
| 157 | 242.44 | 1.4105 | 91.40 | 91.6 | 1.4078 | 90.85 | 91.3 | 1.4149 | 92.27 | 92.6 |
| 158 | 260.52 | 1.3686 | 92.92 | 93.2 | 1.3646 | 92.02 | 92.4 | 1.3629 | 91.63 | 92.0 |
| 153 | 280.52 | 1.2646 | 91.04 | 91.4 | 1.2601 | 89.61 | 90.0 | 1.2400 | 83.19 | 83.7 |

Table B-1. Overall Performance (Continued)
SLTO Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor | | | Guide Vane Rotor | | | Stage | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\overline{P}_2/\overline{P}_1$ | $\eta_{ad}\%$ | $\eta_p\%$ | $\overline{P}_2/P_0$ | $\eta_{ad}\%$ | $\eta_p\%$ | $\overline{P}_{2A}/P_0$ | $\eta_{ad}\%$ | $\eta_p\%$ |
| | | 110% Design Equivalent Rotor Speed | | | | | | | | |
| 161 | 223.62 | 1.5422 | 77.85 | 79.2 | 1.5385 | 77.72 | 79.1 | 1.5237 | 75.88 | 77.4 |
| 165 | 279.67 | 1.4131 | 90.11 | 90.6 | 1.4106 | 89.74 | 90.2 | 1.3896 | 85.66 | 86.3 |
| 160 | 290.69 | 1.2956 | 87.62 | 88.1 | 1.2907 | 86.43 | 86.9 | 1.2737 | 81.77 | 82.4 |

Table B-1. Overall Performance (Continued)
Cruise Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor | | | Guide Vane Rotor | | | Stage | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{P}_2/\bar{P}_1$ | $\eta_{ad}\%$ | $\eta_p\%$ | $\bar{P}_2/P_0$ | $\eta_{ad}\%$ | $\eta_p\%$ | $\bar{P}_{2A}/P_0$ | $\eta_{ad}\%$ | $\eta_p\%$ |
| | | 50% Design Equivalent Rotor Speed | | | | | | | | |
| 182 | 85.57 | 1.0912 | 83.59 | 84.0 | 1.0908 | 83.30 | 83.7 | 1.0875 | 80.32 | 80.6 |
| 183 | 91.01 | 1.0890 | 91.11 | 91.3 | 1.0884 | 90.52 | 90.7 | 1.0837 | 85.85 | 86.0 |
| 184 | 99.51 | 1.0835 | 94.06 | 94.1 | 1.0830 | 93.53 | 93.7 | 1.0786 | 88.71 | 88.8 |
| 185 | 106.21 | 1.0763 | 95.23 | 95.3 | 1.0754 | 94.12 | 94.2 | 1.0710 | 88.75 | 88.9 |
| 186 | 114.70 | 1.0647 | 95.88 | 96.0 | 1.0639 | 96.68 | 96.8 | 1.0598 | 88.83 | 88.9 |
| 181 | 121.02 | 1.0586 | 96.13 | 96.2 | 1.0573 | 94.06 | 94.1 | 1.0519 | 85.32 | 85.4 |
| | | 70% Design Equivalent Rotor Speed | | | | | | | | |
| 168 | 118.88 | 1.1800 | 85.03 | 85.4 | 1.1792 | 84.70 | 85.1 | 1.1739 | 82.33 | 82.7 |
| 169 | 125.53 | 1.1796 | 89.35 | 89.6 | 1.1781 | 88.64 | 88.9 | 1.1704 | 85.03 | 85.4 |
| 170 | 131.27 | 1.1744 | 91.93 | 92.2 | 1.1733 | 91.41 | 91.7 | 1.1648 | 87.14 | 87.4 |
| 171 | 140.07 | 1.1600 | 93.68 | 93.9 | 1.1604 | 93.93 | 94.0 | 1.1536 | 90.15 | 90.4 |
| 173 | 152.68 | 1.1441 | 101.47 | ---- | 1.1433 | 100.93 | ---- | 1.1365 | 96.35 | 96.4 |
| 167 | 166.46 | 1.1187 | 100.01 | 100.0 | 1.1168 | 98.49 | 98.6 | 1.1022 | 86.56 | 86.7 |

Table B-1. Overall Performance (Continued)
Cruise Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor $\bar{P}_2/\bar{P}_1$ | Rotor $\eta_{ad}\%$ | Rotor $\eta_p\%$ | Guide Vane Rotor $\bar{P}_2/P_0$ | Guide Vane Rotor $\eta_{ad}\%$ | Guide Vane Rotor $\eta_p\%$ | Stage $\bar{P}_{2A}/P_0$ | Stage $\eta_{ad}\%$ | Stage $\eta_p\%$ |
|---|---|---|---|---|---|---|---|---|---|---|
| 80% Design Equivalent Rotor Speed | | | | | | | | | | |
| 175 | 138.10 | 1.2421 | 86.29 | 86.7 | 1.2406 | 85.82 | 86.3 | 1.2341 | 83.65 | 84.1 |
| 177 | 147.54 | 1.2312 | 88.22 | 88.6 | 1.2298 | 87.72 | 88.1 | 1.2217 | 84.83 | 85.3 |
| 178 | 157.91 | 1.2170 | 88.66 | 89.0 | 1.2147 | 87.80 | 88.2 | 1.2140 | 87.53 | 87.9 |
| 179 | 166.19 | 1.2059 | 94.71 | 94.8 | 1.2022 | 93.10 | 93.3 | 1.1955 | 90.19 | 90.4 |
| 180 | 176.48 | 1.1815 | 95.82 | 96.0 | 1.1790 | 94.55 | 94.7 | 1.1701 | 90.09 | 90.3 |
| 174 | 189.09 | 1.1507 | 97.86 | 98.0 | 1.1480 | 96.15 | 96.3 | 1.1334 | 87.08 | 87.3 |
| 100% Design Equivalent Rotor Speed | | | | | | | | | | |
| 190 | 175.83 | 1.3922 | 85.12 | 85.8 | 1.3908 | 84.85 | 85.5 | 1.3732 | 81.43 | 82.3 |
| 191 | 184.90 | 1.3889 | 86.26 | 86.9 | 1.3865 | 85.79 | 86.4 | 1.3856 | 85.60 | 86.3 |
| 192 | 193.09 | 1.3822 | 89.67 | 90.2 | 1.3795 | 89.10 | 89.6 | 1.3758 | 88.32 | 88.8 |
| 193 | 205.90 | 1.3582 | 93.61 | 93.9 | 1.3551 | 92.87 | 93.2 | 1.3436 | 90.15 | 90.6 |
| 194 | 217.46 | 1.3126 | 93.31 | 93.6 | 1.3099 | 92.58 | 92.9 | 1.2991 | 89.62 | 90.0 |
| 189 | 232.54 | 1.2526 | 95.94 | 96.1 | 1.2460 | 93.60 | 93.8 | 1.2216 | 84.96 | 85.4 |

Table B-1 Overall Performance (Continued)
Intermediate Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor | | | Guide Vane Rotor | | | Stage | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{P}_2/\bar{P}_1$ | $\eta_{ad}$% | $\eta_p$% | $\bar{P}_2/P_0$ | $\eta_{ad}$% | $\eta_p$% | $\bar{P}_{2A}/P_0$ | $\eta_{ad}$% | $\eta_p$% |
| 50% Design Equivalent Rotor Speed | | | | | | | | | | |
| 215 | 89.71 | 1.0937 | 86.28 | 86.5 | 1.0933 | 85.95 | 86.2 | 1.0872 | 80.44 | 80.7 |
| 216 | 97.29 | 1.0888 | 81.87 | 82.2 | 1.0886 | 81.66 | 82.0 | 1.0859 | 79.28 | 79.5 |
| 217 | 113.09 | 1.0810 | 90.35 | 90.6 | 1.0801 | 89.40 | 89.6 | 1.0798 | 89.06 | 89.2 |
| 218 | 121.61 | 1.0719 | 99.21 | 99.2 | 1.0710 | 97.99 | 98.1 | 1.0684 | 94.45 | 94.5 |
| 214 | 138.41 | 1.0572 | 92.93 | 93.1 | 1.0563 | 91.52 | 91.7 | 1.0545 | 88.61 | 88.7 |
| 70% Design Equivalent Rotor Speed | | | | | | | | | | |
| 209 | 129.82 | 1.1899 | 82.79 | 83.3 | 1.1892 | 82.49 | 83.0 | 1.1777 | 77.76 | 78.3 |
| 210 | 142.02 | 1.1820 | 88.24 | 88.6 | 1.1809 | 87.73 | 88.0 | 1.1764 | 85.65 | 86.0 |
| 211 | 163.55 | 1.1610 | 90.15 | 90.4 | 1.1509 | 89.05 | 89.3 | 1.1572 | 88.09 | 88.3 |
| 212 | 180.36 | 1.1367 | 92.59 | 92.8 | 1.1397 | 94.53 | 94.6 | 1.1384 | 93.73 | 93.8 |
| 208 | 193.55 | 1.1138 | 97.61 | 97.7 | 1.1128 | 96.78 | 96.9 | 1.1097 | 94.23 | 94.3 |

Table B-1. Overall Performance (Continued)
Intermediate Configuration

| Point Number | Corrected Weight Flow $W\sqrt{\theta}/\delta$ lb/sec | Rotor | | | Guide Vane Rotor | | | Stage | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{P}_2/\bar{P}_1$ | $\eta_{ad}$% | $\eta_p$% | $\bar{P}_2/P_0$ | $\eta_{ad}$% | $\eta_p$% | $\bar{P}_{2A}/P_0$ | $\eta_{ad}$% | $\eta_p$% |
| 80% Design Equivalent Rotor Speed | | | | | | | | | | |
| 203 | 146.41 | 1.2555 | 85.27 | 85.8 | 1.2542 | 84.87 | 85.4 | 1.2364 | 79.36 | 80.0 |
| 204 | 150.21 | 1.2473 | 83.35 | 84.0 | 1.2462 | 83.01 | 83.6 | 1.2362 | 79.86 | 80.5 |
| 205 | 171.33 | 1.2394 | 88.92 | 89.3 | 1.2375 | 88.28 | 88.6 | 1.2328 | 86.65 | 87.0 |
| 206 | 188.93 | 1.2158 | 92.47 | 92.7 | 1.2132 | 91.45 | 91.8 | 1.2085 | 89.55 | 89.8 |
| 202 | 217.93 | 1.1558 | 97.29 | 97.4 | 1.1520 | 95.03 | 95.1 | 1.1410 | 88.50 | 88.7 |
| 100% Design Equivalent Rotor Speed | | | | | | | | | | |
| 197 | 190.95 | 1.4165 | 83.83 | 84.7 | 1.4165 | 83.83 | 84.7 | 1.4105 | 82.75 | 83.6 |
| 198 | 199.54 | 1.4242 | 83.59 | 84.4 | 1.4239 | 83.53 | 84.4 | 1.4158 | 82.12 | 83.0 |
| 199 | 216.15 | 1.4030 | 86.30 | 86.9 | 1.4010 | 85.93 | 86.6 | 1.4085 | 87.36 | 88.0 |
| 200 | 238.11 | 1.3645 | 91.75 | 92.1 | 1.3615 | 91.07 | 91.4 | 1.3565 | 89.92 | 90.3 |
| 196 | 262.57 | 1.2362 | 94.44 | 94.6 | 1.2325 | 93.06 | 93.3 | 1.2230 | 89.52 | 89.8 |

# Table B-2. Blade Element Data SLTO Configuration

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 147 | SLTO | 3010. | 92.57 |

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| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.284 | 0.984 | -0.426 | -1.177 | -3.459 |
| V 3 | 138.93 | 146.54 | 151.75 | 155.09 | 155.85 |
| V 4 | 139.12 | 154.69 | 160.03 | 165.16 | 163.45 |
| VZ 3 | 138.93 | 146.32 | 151.74 | 155.08 | 155.84 |
| VZ 4 | 139.11 | 153.83 | 160.02 | 165.12 | 163.16 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 0.69 | 2.66 | -1.19 | -3.39 | -9.86 |
| M 3 | 0.1246 | 0.1315 | 0.1362 | 0.1392 | 0.1399 |
| M 4 | 0.1248 | 0.1388 | 0.1436 | 0.1483 | 0.1467 |
| TURN | -0.28 | -0.98 | 0.43 | 1.18 | 3.46 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.001 | -0.046 | -0.059 | -0.076 | -0.080 |
| EFFP | 0.2800 | 1.1960 | 0.8399 | 1.0855 | 0.7933 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.116 | 2.716 | 2.326 | 1.477 | 1.859 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.597 | 53.512 | 50.039 | 44.301 | 43.054 |
| BETA 10 | 0.288 | 1.200 | 0.030 | 1.342 | 2.281 |
| V 9 | 288.30 | 265.71 | 262.73 | 285.37 | 285.89 |
| V 10 | 166.33 | 184.79 | 187.35 | 219.23 | 249.19 |
| VZ 9 | 191.48 | 156.71 | 168.04 | 204.06 | 208.90 |
| VZ 10 | 164.62 | 183.02 | 186.51 | 218.93 | 249.00 |
| V-THETA 9 | 212.88 | 213.62 | 201.38 | 199.31 | 195.18 |
| V-THETA 10 | 0.84 | 3.87 | 0.10 | 5.14 | 9.92 |
| M 9 | 0.2570 | 0.2362 | 0.2333 | 0.2533 | 0.2533 |
| M 10 | 0.1477 | 0.1639 | 0.1660 | 0.1941 | 0.2205 |
| TURN | 47.309 | 52.312 | 50.009 | 42.958 | 40.773 |
| $\bar{\omega}$ | 0.2531 | 0.1709 | 0.1983 | 0.2049 | 0.1413 |
| DFAC | 0.7034 | 0.6286 | 0.6240 | 0.5503 | 0.4439 |
| EFFP | 0.4012 | 0.5218 | 0.2770 | 0.1000 | -0.0443 |
| INCIDM | 6.697 | 16.412 | 15.339 | 10.301 | 7.054 |
| DEVM | 8.988 | 8.700 | 7.530 | 9.342 | 11.161 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.240 | 0.874 | -0.462 | -1.120 | -3.352 |
| BETA 7 | 48.502 | 54.707 | 51.618 | 45.963 | 44.933 |
| BETA(PR) 6 | 63.368 | 65.938 | 68.607 | 70.056 | 72.540 |
| BETA(PR) 7 | 30.876 | 47.209 | 54.368 | 55.273 | 59.822 |
| V 6 | 153.73 | 161.86 | 165.85 | 175.21 | 172.28 |
| V 7 | 291.19 | 266.26 | 260.66 | 278.50 | 276.09 |
| VZ 6 | 153.69 | 161.67 | 165.81 | 175.16 | 171.98 |
| VZ 7 | 191.80 | 153.66 | 161.75 | 193.56 | 195.45 |
| V-THETA 6 | 0.64 | 2.47 | -1.34 | -3.42 | -10.07 |
| V-THETA 7 | 218.10 | 217.32 | 204.33 | 200.21 | 195.00 |
| V(PR) 6 | 342.9 | 396.6 | 454.6 | 513.5 | 573.2 |
| V(PR) 7 | 224.8 | 226.5 | 277.8 | 339.8 | 388.8 |
| VTHETA PR6 | -306.5 | -362.1 | -423.3 | -482.7 | -546.8 |
| VTHETA PR7 | -115.4 | -166.2 | -225.8 | -279.3 | -336.1 |
| U 6 | 307.13 | 364.52 | 421.92 | 479.31 | 536.70 |
| U 7 | 333.46 | 383.50 | 430.13 | 479.51 | 531.12 |
| M 6 | 0.1380 | 0.1453 | 0.1489 | 0.1573 | 0.1547 |
| M 7 | 0.2596 | 0.2367 | 0.2315 | 0.2471 | 0.2446 |
| M(PR) 6 | 0.3077 | 0.3560 | 0.4081 | 0.4611 | 0.5147 |
| M(PR) 7 | 0.2004 | 0.2013 | 0.2467 | 0.3016 | 0.3444 |
| TURN(PR) | 32.486 | 18.706 | 14.234 | 14.782 | 12.717 |
| $\bar{\omega}$ | 0.1318 | 0.2543 | 0.3237 | 0.2437 | 0.2687 |
| DFAC | .5765 | .6423 | .5792 | .5150 | .4899 |
| EFFP | 1.0564 | 0.9054 | 0.8970 | 0.9115 | 0.8529 |
| EFF | 1.0570 | 0.9043 | 0.8957 | 0.9102 | 0.8508 |
| INCIDM | 14.768 | 13.438 | 12.507 | 10.456 | 9.340 |
| DEVM | 12.076 | 14.709 | 12.268 | 6.673 | 6.922 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 148 | SLTO | 3000. | 100.7 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.326 | 0.622 | -0.862 | -1.665 | -4.510 |
| V 3 | 150.55 | 159.36 | 165.53 | 169.10 | 169.78 |
| V 4 | 153.60 | 168.11 | 174.74 | 180.01 | 178.68 |
| VZ 3 | 150.55 | 159.14 | 165.53 | 169.10 | 169.77 |
| VZ 4 | 153.59 | 166.96 | 174.71 | 179.93 | 178.13 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 0.87 | 1.82 | -2.63 | -5.23 | -14.05 |
| M 3 | 0.1351 | 0.1430 | 0.1486 | 0.1518 | 0.1524 |
| M 4 | 0.1378 | 0.1509 | 0.1569 | 0.1617 | 0.1605 |
| TURN | -0.33 | -0.62 | 0.86 | 1.67 | 4.51 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.017 | -0.049 | -0.064 | -0.080 | -0.094 |
| EFFP | 0.9649 | 1.0899 | 0.9150 | 1.0369 | 0.8061 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.074 | 3.078 | 2.762 | 1.965 | 2.910 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.965 | 48.107 | 43.694 | 39.883 | 37.275 |
| BETA 10 | 1.304 | 1.902 | 1.701 | 2.104 | 0.743 |
| V 9 | 289.91 | 268.67 | 270.04 | 286.94 | 284.13 |
| V 10 | 180.92 | 200.68 | 211.36 | 238.19 | 264.09 |
| VZ 9 | 190.62 | 177.71 | 194.48 | 220.04 | 226.09 |
| VZ 10 | 179.19 | 198.45 | 210.35 | 237.83 | 264.06 |
| V-THETA 9 | 215.32 | 200.00 | 186.54 | 183.99 | 172.08 |
| V-THETA 10 | 4.12 | 6.66 | 6.27 | 8.75 | 3.42 |
| M 9 | 0.2584 | 0.2391 | 0.2401 | 0.2550 | 0.2521 |
| M 10 | 0.1606 | 0.1782 | 0.1875 | 0.2113 | 0.2341 |
| TURN | 46.661 | 46.205 | 41.992 | 37.778 | 36.532 |
| $\bar{\omega}$ | 0.2395 | 0.1033 | 0.0736 | 0.1172 | 0.0543 |
| DFAC | 0.6534 | 0.5484 | 0.5109 | 0.4558 | 0.3595 |
| EFFP | 0.4330 | 0.5225 | 0.3956 | 0.2535 | 0.2300 |
| INCIDM | 7.065 | 11.007 | 8.994 | 5.883 | 1.275 |
| DEVM | 10.004 | 9.402 | 9.201 | 10.104 | 9.643 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.276 | 0.534 | -0.887 | -1.586 | -4.519 |
| BETA 7 | 48.993 | 49.520 | 45.455 | 41.272 | 39.167 |
| BETA(PR) 6 | 61.326 | 64.022 | 66.554 | 68.395 | 71.220 |
| BETA(PR) 7 | 29.845 | 45.663 | 52.070 | 54.267 | 59.140 |
| V 6 | 167.02 | 176.45 | 183.66 | 191.37 | 187.50 |
| V 7 | 293.84 | 268.22 | 265.81 | 280.42 | 274.41 |
| VZ 6 | 166.97 | 176.23 | 183.61 | 191.29 | 186.91 |
| VZ 7 | 191.72 | 173.94 | 186.35 | 210.72 | 212.75 |
| V-THETA 6 | 0.80 | 1.64 | -2.84 | -5.30 | -14.77 |
| V-THETA 7 | 221.74 | 204.02 | 189.44 | 184.97 | 173.31 |
| V(PR) 6 | 348.0 | 402.4 | 461.5 | 519.5 | 580.6 |
| V(PR) 7 | 222.3 | 249.2 | 303.3 | 360.9 | 414.8 |
| VTHETA PR6 | -305.3 | -361.7 | -423.4 | -483.0 | -549.7 |
| VTHETA PR7 | -110.6 | -178.2 | -239.3 | -292.9 | -356.0 |
| U 6 | 306.11 | 363.31 | 420.52 | 477.72 | 534.92 |
| U 7 | 332.35 | 382.23 | 428.70 | 477.91 | 529.36 |
| M 6 | 0.1499 | 0.1584 | 0.1650 | 0.1719 | 0.1684 |
| M 7 | 0.2620 | 0.2387 | 0.2363 | 0.2491 | 0.2434 |
| M(PR) 6 | 0.3124 | 0.3614 | 0.4145 | 0.4667 | 0.5215 |
| M(PR) 7 | 0.1982 | 0.2217 | 0.2697 | 0.3206 | 0.3679 |
| TURN(PR) | 31.474 | 18.331 | 14.480 | 14.127 | 12.083 |
| $\bar{\omega}$ | 0.1926 | 0.2622 | 0.2575 | 0.1808 | 0.1850 |
| DFAC | .5938 | .5790 | .5182 | .4685 | .4381 |
| EFFP | 1.0029 | 0.9454 | 0.9404 | 0.9458 | 0.8902 |
| EFF | 1.0030 | 0.9447 | 0.9396 | 0.9451 | 0.8887 |
| INCIDM | 12.726 | 11.522 | 10.454 | 8.795 | 8.020 |
| DEVM | 11.045 | 13.163 | 9.970 | 5.667 | 6.240 |

# Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 149 | SLTO | 3040. | 106.9 |

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| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.615 | 0.790 | -0.845 | -1.587 | -4.456 |
| V 3 | 159.90 | 169.54 | 176.11 | 179.65 | 180.32 |
| V 4 | 164.46 | 178.24 | 185.27 | 190.94 | 190.37 |
| VZ 3 | 159.89 | 169.31 | 176.10 | 179.64 | 180.31 |
| VZ 4 | 164.45 | 176.95 | 185.25 | 190.87 | 189.80 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 1.76 | 2.46 | -2.73 | -5.29 | -14.79 |
| M 3 | 0.1435 | 0.1522 | 0.1581 | 0.1613 | 0.1619 |
| M 4 | 0.1476 | 0.1601 | 0.1664 | 0.1715 | 0.1710 |
| TURN | -0.61 | -0.79 | 0.85 | 1.59 | 4.46 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.023 | -0.044 | -0.060 | -0.078 | -0.097 |
| EFFP | 1.1669 | 1.1205 | 0.9217 | 1.0265 | 0.8979 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.785 | 2.910 | 2.745 | 1.887 | 2.856 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 48.970 | 45.675 | 40.951 | 39.127 | 35.494 |
| BETA 10 | 4.261 | 1.866 | 1.186 | 1.726 | 1.027 |
| V 9 | 302.60 | 284.37 | 286.24 | 297.89 | 295.98 |
| V 10 | 195.73 | 214.24 | 226.40 | 251.83 | 276.30 |
| VZ 9 | 194.82 | 196.83 | 215.45 | 230.98 | 240.97 |
| VZ 10 | 193.46 | 211.92 | 225.50 | 251.56 | 276.24 |
| V-THETA 9 | 228.27 | 203.43 | 187.60 | 187.98 | 171.85 |
| V-THETA 10 | 14.54 | 6.97 | 4.69 | 7.58 | 4.95 |
| M 9 | 0.2697 | 0.2532 | 0.2546 | 0.2647 | 0.2627 |
| M 10 | 0.1737 | 0.1902 | 0.2009 | 0.2234 | 0.2450 |
| TURN | 44.709 | 43.809 | 39.765 | 37.401 | 34.467 |
| $\bar{\omega}$ | 0.2241 | 0.0769 | 0.1043 | 0.0759 | 0.0392 |
| DFAC | 0.6216 | 0.5301 | 0.4902 | 0.4381 | 0.3410 |
| EFFP | 0.5576 | 0.6465 | 0.5567 | 0.5599 | 0.8047 |
| INCIDM | 8.070 | 8.575 | 6.251 | 5.127 | -0.506 |
| DEVM | 12.961 | 9.366 | 8.686 | 9.726 | 9.927 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.533 | 0.679 | -0.793 | -1.521 | -4.590 |
| BETA 7 | 50.150 | 47.238 | 42.449 | 40.483 | 37.310 |
| BETA(PR) 6 | 60.149 | 62.805 | 65.426 | 67.517 | 70.427 |
| BETA(PR) 7 | 27.222 | 43.031 | 49.689 | 53.155 | 57.828 |
| V 6 | 177.13 | 188.26 | 196.16 | 202.66 | 199.06 |
| V 7 | 306.91 | 283.13 | 281.23 | 290.99 | 286.77 |
| VZ 6 | 177.07 | 188.02 | 196.10 | 202.58 | 198.40 |
| VZ 7 | 195.59 | 192.02 | 207.39 | 221.28 | 228.08 |
| V-THETA 6 | 1.65 | 2.23 | -2.71 | -5.38 | -15.96 |
| V-THETA 7 | 235.62 | 207.87 | 189.91 | 188.92 | 173.82 |
| V(PR) 6 | 355.8 | 411.5 | 471.6 | 529.7 | 592.2 |
| V(PR) 7 | 221.2 | 263.0 | 320.8 | 369.1 | 428.4 |
| VTHETA PR6 | -308.5 | -365.9 | -428.9 | -489.5 | -558.0 |
| VTHETA PR7 | -101.2 | -179.5 | -244.6 | -295.4 | -362.6 |
| U 6 | 310.19 | 368.16 | 426.12 | 484.09 | 542.05 |
| U 7 | 336.79 | 387.32 | 434.41 | 484.29 | 536.42 |
| M 6 | 0.1591 | 0.1691 | 0.1763 | 0.1821 | 0.1789 |
| M 7 | 0.2736 | 0.2520 | 0.2502 | 0.2585 | 0.2544 |
| M(PR) 6 | 0.3195 | 0.3697 | 0.4237 | 0.4761 | 0.5322 |
| M(PR) 7 | 0.1971 | 0.2341 | 0.2853 | 0.3279 | 0.3800 |
| TURN(PR) | 32.920 | 19.745 | 15.732 | 14.360 | 12.590 |
| $\bar{\omega}$ | 0.1949 | 0.2400 | 0.2251 | 0.1522 | 0.1555 |
| DFAC | .6192 | .5578 | .4916 | .4667 | .4275 |
| EFFP | 0.9201 | 0.9231 | 0.9391 | 0.9084 | 0.8712 |
| EFF | 0.9192 | 0.9222 | 0.9383 | 0.9072 | 0.8694 |
| INCIDM | 11.549 | 10.305 | 9.326 | 7.917 | 7.227 |
| DEVM | 8.422 | 10.531 | 7.589 | 4.555 | 4.928 |

# Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 150 | SLTO | 3020 | 121.2 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.537 | 0.129 | -0.942 | -1.560 | -4.469 |
| V 3 | 181.78 | 192.95 | 200.36 | 204.42 | 205.32 |
| V 4 | 187.93 | 203.54 | 211.87 | 216.97 | 214.93 |
| VZ 3 | 181.77 | 192.69 | 200.35 | 204.41 | 205.31 |
| VZ 4 | 187.92 | 202.14 | 211.84 | 216.89 | 214.27 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 1.76 | 0.46 | -3.48 | -5.91 | -16.75 |
| M 3 | 0.1633 | 0.1734 | 0.1801 | 0.1837 | 0.1845 |
| M 4 | 0.1688 | 0.1829 | 0.1905 | 0.1951 | 0.1932 |
| TURN | -0.54 | -0.13 | 0.94 | 1.56 | 4.47 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.029 | -0.054 | -0.066 | -0.076 | -0.088 |
| EFFP | 0.7981 | 0.9806 | 0.8969 | 0.9900 | 0.8292 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.863 | 3.571 | 2.842 | 1.860 | 2.869 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 37.778 | 32.848 | 31.462 | 29.254 | 25.252 |
| BETA 10 | 3.504 | 1.119 | 0.587 | -0.062 | 0.882 |
| V 9 | 295.15 | 282.34 | 282.54 | 290.42 | 298.32 |
| V 10 | 251.77 | 251.40 | 260.72 | 277.07 | 295.25 |
| VZ 9 | 228.99 | 235.16 | 240.25 | 253.25 | 269.80 |
| VZ 10 | 249.49 | 249.03 | 259.85 | 276.92 | 295.20 |
| V-THETA 9 | 180.81 | 153.14 | 147.47 | 141.92 | 127.26 |
| V-THETA 10 | 15.39 | 4.91 | 2.67 | -0.30 | 4.55 |
| M 9 | 0.2637 | 0.2521 | 0.2520 | 0.2589 | 0.2658 |
| M 10 | 0.2245 | 0.2242 | 0.2323 | 0.2469 | 0.2630 |
| TURN | 34.274 | 31.728 | 30.875 | 29.316 | 24.370 |
| $\bar{\omega}$ | 0.1240 | 0.0281 | 0.0494 | 0.0019 | 0.0081 |
| DFAC | 0.3597 | 0.3251 | 0.3027 | 0.2752 | 0.2106 |
| EFFP | 0.4467 | 0.4137 | 0.4486 | 0.3464 | -1.5058 |
| INCIDM | -3.122 | -4.252 | -3.238 | -4.746 | -10.748 |
| DEVM | 12.204 | 8.619 | 8.087 | 7.938 | 9.782 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.456 | 0.027 | -0.934 | -1.480 | -4.555 |
| BETA 7 | 39.448 | 34.407 | 32.838 | 30.467 | 26.576 |
| BETA(PR) 6 | 56.462 | 59.349 | 62.333 | 64.782 | 68.045 |
| BETA(PR) 7 | 32.812 | 44.814 | 50.592 | 54.346 | 57.504 |
| V 6 | 203.24 | 216.91 | 223.91 | 229.36 | 224.98 |
| V 7 | 295.23 | 277.86 | 275.78 | 281.58 | 287.83 |
| VZ 6 | 203.18 | 216.67 | 223.85 | 229.27 | 224.27 |
| VZ 7 | 226.90 | 229.01 | 231.59 | 242.67 | 257.41 |
| V-THETA 6 | 1.62 | 0.10 | -3.65 | -5.92 | -17.87 |
| V-THETA 7 | 187.59 | 157.01 | 149.55 | 142.77 | 128.77 |
| V(PR) 6 | 367.8 | 425.1 | 482.1 | 538.1 | 599.9 |
| V(PR) 7 | 271.3 | 323.2 | 365.0 | 416.4 | 479.1 |
| VTHETA PR6 | -306.5 | -365.6 | -427.0 | -486.8 | -556.4 |
| VTHETA PR7 | -147.0 | -227.8 | -282.0 | -338.3 | -404.1 |
| U 6 | 308.15 | 365.73 | 423.32 | 480.90 | 538.49 |
| U 7 | 334.57 | 384.78 | 431.55 | 481.10 | 532.89 |
| M 6 | 0.1827 | 0.1950 | 0.2014 | 0.2063 | 0.2024 |
| M 7 | 0.2637 | 0.2481 | 0.2459 | 0.2510 | 0.2563 |
| M(PR) 6 | 0.3305 | 0.3823 | 0.4336 | 0.4841 | 0.5395 |
| M(PR) 7 | 0.2423 | 0.2885 | 0.3255 | 0.3711 | 0.4267 |
| TURN(PR) | 23.643 | 14.508 | 11.738 | 10.435 | 10.541 |
| $\bar{\omega}$ | 0.1127 | 0.1260 | 0.1112 | 0.0083 | 0.1124 |
| DFAC | .4475 | .3853 | .3766 | .3493 | .3158 |
| EFFP | 1.1251 | 1.1687 | 1.1052 | 1.0882 | 1.0721 |
| EFF | 1.1264 | 1.1705 | 1.1065 | 1.0893 | 1.073[illegible] |
| INCIDM | 7.862 | 6.849 | 6.233 | 5.182 | 4.845 |
| DEVM | 14.012 | 12.314 | 8.492 | 5.746 | 4.604 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 151 | SLTO | 3040 | 133.1 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.765 | 0.230 | -0.989 | -1.571 | -3.603 |
| V 3 | 201.81 | 213.86 | 221.41 | 224.85 | 224.80 |
| V 4 | 209.04 | 225.49 | 233.35 | 237.63 | 236.37 |
| VZ 3 | 201.79 | 213.59 | 221.39 | 224.84 | 224.79 |
| VZ 4 | 209.02 | 224.18 | 233.30 | 237.54 | 235.90 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 2.79 | 0.90 | -4.03 | -6.51 | -14.85 |
| M 3 | 0.1814 | 0.1923 | 0.1991 | 0.2022 | 0.2022 |
| M 4 | 0.1879 | 0.2028 | 0.2099 | 0.2138 | 0.2127 |
| TURN | -0.76 | -0.23 | 0.99 | 1.57 | 3.60 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.029 | -0.052 | -0.063 | -0.071 | -0.084 |
| EFFP | 0.9543 | 1.0426 | 0.9280 | 1.0217 | 0.8914 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.635 | 3.470 | 2.889 | 1.871 | 2.003 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 34.339 | 30.600 | 27.558 | 25.609 | 22.189 |
| BETA 10 | 2.086 | 0.412 | 0.169 | -0.676 | 1.157 |
| V 9 | 333.83 | 317.64 | 315.30 | 320.11 | 318.71 |
| V 10 | 305.68 | 291.50 | 294.44 | 299.54 | 309.26 |
| VZ 9 | 270.97 | 271.50 | 279.03 | 288.66 | 295.02 |
| VZ 10 | 303.61 | 289.40 | 293.92 | 299.51 | 309.09 |
| V-THETA 9 | 188.31 | 161.69 | 145.87 | 138.36 | 120.37 |
| V-THETA 10 | 11.13 | 2.09 | 0.87 | -3.53 | 6.24 |
| M 9 | 0.2987 | 0.2839 | 0.2817 | 0.2858 | 0.2844 |
| M 10 | 0.2731 | 0.2602 | 0.2628 | 0.2672 | 0.2758 |
| TURN | 32.253 | 30.188 | 27.389 | 26.285 | 21.032 |
| $\bar{\omega}$ | 0.0501 | 0.0259 | 0.0405 | 0.0237 | 0.0233 |
| DFAC | 0.2861 | 0.2886 | 0.2685 | 0.2718 | 0.2040 |
| EFFP | 0.6206 | 0.5071 | 0.4567 | 0.3866 | 0.8364 |
| INCIDM | -6.561 | -6.500 | -7.142 | -8.391 | -13.811 |
| DEVM | 10.786 | 7.912 | 7.669 | 7.324 | 10.057 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.666 | 0.124 | -0.893 | -1.540 | -3.781 |
| BETA 7 | 36.206 | 32.184 | 28.739 | 26.752 | 23.041 |
| BETA(PR) 6 | 53.505 | 56.661 | 59.957 | 62.806 | 66.581 |
| BETA(PR) 7 | 27.929 | 40.132 | 46.819 | 51.194 | 55.051 |
| V 6 | 227.60 | 242.06 | 248.77 | 252.32 | 242.23 |
| V 7 | 330.69 | 310.82 | 306.97 | 310.34 | 314.04 |
| VZ 6 | 227.53 | 241.85 | 248.69 | 252.21 | 241.70 |
| VZ 7 | 265.62 | 262.80 | 269.02 | 277.07 | 288.99 |
| V-THETA 6 | 2.64 | 0.52 | -3.88 | -6.78 | -15.97 |
| V-THETA 7 | 195.33 | 165.56 | 147.60 | 139.69 | 122.91 |
| V(PR) 6 | 382.6 | 440.2 | 496.8 | 551.9 | 608.1 |
| V(PR) 7 | 302.0 | 344.1 | 393.3 | 442.2 | 504.5 |
| VTHETA PR6 | -307.5 | -367.6 | -430.0 | -490.9 | -558.0 |
| VTHETA PR7 | -141.5 | -221.8 | -286.8 | -344.6 | -413.5 |
| U 6 | 310.19 | 368.16 | 426.12 | 484.09 | 542.05 |
| U 7 | 336.79 | 387.32 | 434.41 | 484.29 | 536.42 |
| M 6 | 0.2047 | 0.2179 | 0.2240 | 0.2272 | 0.2180 |
| M 7 | 0.2958 | 0.2777 | 0.2742 | 0.2770 | 0.2801 |
| M(PR) 6 | 0.3441 | 0.3961 | 0.4472 | 0.4969 | 0.5473 |
| M(PR) 7 | 0.2701 | 0.3075 | 0.3513 | 0.3947 | 0.4500 |
| TURN(PR) | 25.569 | 16.506 | 13.133 | 11.610 | 11.530 |
| $\bar{\omega}$ | 0.0978 | 0.0677 | 0.0825 | 0.0774 | 0.1028 |
| DFAC | .3958 | .3656 | .3362 | .3174 | .2773 |
| EFFP | 1.0141 | 1.0138 | 1.0241 | 0.9922 | 0.9801 |
| EFF | 1.0143 | 1.0140 | 1.0243 | 0.9921 | 0.9799 |
| INCIDM | 4.905 | 4.161 | 3.857 | 3.206 | 3.381 |
| DEVM | 9.129 | 7.632 | 4.719 | 2.594 | 2.151 |

# Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}\,\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 146 | SLTO | 3040. | 149.4 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.860 | 0.320 | -0.864 | -1.107 | -3.890 |
| V 3 | 227.95 | 241.46 | 249.67 | 253.41 | 253.36 |
| V 4 | 236.38 | 255.73 | 263.69 | 269.01 | 264.48 |
| VZ 3 | 227.92 | 241.16 | 249.65 | 253.39 | 253.35 |
| VZ 4 | 236.35 | 254.37 | 263.64 | 268.95 | 263.87 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 3.63 | 1.43 | -3.98 | -5.20 | -17.94 |
| M 3 | 0.2050 | 0.2173 | 0.2248 | 0.2282 | 0.2281 |
| M 4 | 0.2127 | 0.2303 | 0.2375 | 0.2424 | 0.2382 |
| TURN | -0.88 | -0.32 | 0.86 | 1.11 | 3.89 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.029 | -0.056 | -0.064 | -0.072 | -0.079 |
| EFFP | 0.8320 | 1.0064 | 0.8527 | 1.0275 | 0.7459 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.520 | 3.380 | 2.764 | 1.407 | 2.290 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 25.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 28.330 | 24.832 | 22.059 | 19.654 | 17.069 |
| BETA 10 | 1.614 | 0.717 | 0.147 | -0.655 | 1.044 |
| V 9 | 370.11 | 353.28 | 341.80 | 337.11 | 326.57 |
| V 10 | 367.32 | 349.12 | 340.57 | 336.21 | 337.98 |
| VZ 9 | 320.57 | 318.63 | 316.31 | 317.46 | 312.12 |
| VZ 10 | 365.17 | 346.90 | 340.09 | 336.18 | 337.83 |
| V-THETA 9 | 175.64 | 148.36 | 128.37 | 113.38 | 95.86 |
| V-THETA 10 | 10.34 | 4.37 | 0.87 | -3.84 | 6.16 |
| M 9 | 0.3320 | 0.3167 | 0.3062 | 0.3019 | 0.2922 |
| M 10 | 0.3295 | 0.3129 | 0.3050 | 0.3011 | 0.3026 |
| TURN | 26.717 | 24.115 | 21.911 | 20.309 | 16.025 |
| $\bar{\omega}$ | 0.0465 | 0.0301 | 0.0245 | 0.0264 | 0.0436 |
| DFAC | 0.1773 | 0.1791 | 0.1677 | 0.1654 | 0.0988 |
| EFFP | -3.4494 | -1.9349 | -8.3529 | -15.6625 | 1.4936 |
| INCIDM | -12.570 | -12.268 | -12.641 | -14.346 | -18.931 |
| DEVM | 10.314 | 8.217 | 7.647 | 7.345 | 9.944 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.766 | 0.187 | -0.842 | -1.116 | -3.870 |
| BETA 7 | 30.180 | 26.316 | 23.190 | 20.672 | 17.097 |
| BETA(PR) 6 | 49.819 | 53.086 | 56.860 | 59.912 | 64.249 |
| BETA(PR) 7 | 26.199 | 37.425 | 44.726 | 50.253 | 54.903 |
| V 6 | 259.12 | 276.10 | 280.99 | 283.75 | 270.90 |
| V 7 | 362.89 | 342.99 | 333.08 | 327.64 | 324.29 |
| VZ 6 | 259.03 | 275.89 | 280.90 | 283.68 | 270.28 |
| VZ 7 | 312.35 | 307.15 | 306.02 | 306.50 | 309.96 |
| V-THETA 6 | 3.47 | 0.90 | -4.13 | -5.53 | -18.28 |
| V-THETA 7 | 182.43 | 152.05 | 131.16 | 115.66 | 95.34 |
| V(PR) 6 | 401.5 | 459.5 | 513.9 | 565.9 | 622.1 |
| V(PR) 7 | 349.6 | 387.1 | 430.9 | 479.4 | 539.1 |
| VTHETA PR6 | -306.7 | -367.3 | -430.3 | -489.6 | -560.3 |
| VTHETA PR7 | -154.4 | -235.3 | -303.2 | -368.6 | -441.1 |
| U 6 | 310.19 | 368.16 | 426.12 | 484.09 | 542.05 |
| U 7 | 336.79 | 387.32 | 434.41 | 484.29 | 536.42 |
| M 6 | 0.2334 | 0.2488 | 0.2533 | 0.2558 | 0.2441 |
| M 7 | 0.3254 | 0.3073 | 0.2982 | 0.2932 | 0.2901 |
| M(PR) 6 | 0.3616 | 0.4141 | 0.4632 | 0.5102 | 0.5605 |
| M(PR) 7 | 0.3135 | 0.3468 | 0.3858 | 0.4291 | 0.4822 |
| TURN(PR) | 23.613 | 15.639 | 12.129 | 9.658 | 9.345 |
| $\bar{\omega}$ | 0.1106 | 0.0840 | 0.0752 | 0.0713 | 0.0941 |
| DFAC | .2926 | .2875 | .2726 | .2486 | .2188 |
| EFFP | 0.9984 | 0.9826 | 0.9791 | 0.9651 | 0.9606 |
| EFF | 0.9984 | 0.9825 | 0.9790 | 0.9647 | 0.9602 |
| INCIDM | 1.219 | 0.586 | 0.760 | 0.312 | 1.049 |
| DEVM | 7.399 | 4.925 | 2.626 | 1.653 | 2.003 |

Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70 PERCENT SPEED PT. 140 | SLTO | 4255. | 133.8 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.113 | 0.772 | -0.424 | -0.839 | -2.870 |
| V 3 | 205.49 | 216.49 | 222.70 | 225.74 | 225.24 |
| V 4 | 202.69 | 224.35 | 234.07 | 241.83 | 239.48 |
| VZ 3 | 205.49 | 216.09 | 222.69 | 225.73 | 225.23 |
| VZ 4 | 202.61 | 223.41 | 233.97 | 241.77 | 239.18 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 3.94 | 3.02 | -1.73 | -3.54 | -11.99 |
| M 3 | 0.1847 | 0.1947 | 0.2003 | 0.2030 | 0.2026 |
| M 4 | 0.1822 | 0.2018 | 0.2106 | 0.2176 | 0.2155 |
| TURN | -1.11 | -0.77 | 0.42 | 0.84 | 2.87 |
| $\bar{\omega}$ | 0.0201 | | 0.0257 | | 0.0240 |
| DFAC | 0.023 | -0.029 | -0.055 | -0.079 | -0.090 |
| EFFP | 6.8871 | 1.0923 | 0.8388 | 1.1130 | 0.8089 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.287 | 2.928 | 2.324 | 1.139 | 1.270 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 46.618 | 48.963 | 48.717 | 43.577 | 42.177 |
| BETA 10 | 2.473 | 1.747 | -0.207 | 1.092 | 4.663 |
| V 9 | 394.58 | 376.19 | 369.48 | 394.81 | 401.99 |
| V 10 | 238.07 | 264.76 | 260.57 | 300.34 | 346.98 |
| VZ 9 | 267.33 | 245.69 | 243.35 | 286.00 | 297.82 |
| VZ 10 | 235.12 | 263.02 | 260.06 | 300.25 | 345.74 |
| V-THETA 9 | 286.78 | 283.75 | 277.65 | 272.15 | 269.91 |
| V-THETA 10 | 10.27 | 8.07 | -0.94 | 5.72 | 28.21 |
| M 9 | 0.3502 | 0.3325 | 0.3255 | 0.3475 | 0.3525 |
| M 10 | 0.2097 | 0.2329 | 0.2285 | 0.2631 | 0.3035 |
| TURN | 44.146 | 47.216 | 48.924 | 42.484 | 37.515 |
| $\bar{\omega}$ | 0.2298 | 0.1710 | 0.1975 | 0.2128 | 0.1285 |
| DFAC | 0.6633 | 0.5970 | 0.6266 | 0.5552 | 0.4297 |
| EFFP | 0.4058 | 0.4741 | 0.3223 | 0.2466 | 0.2754 |
| INCIDM | 5.718 | 11.863 | 14.017 | 9.577 | 6.177 |
| DEVM | 11.173 | 9.247 | 7.293 | 9.092 | 13.563 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.965 | 0.571 | -0.480 | -0.878 | -3.052 |
| BETA 7 | 47.772 | 50.060 | 50.163 | 44.975 | 42.970 |
| BETA(PR) 6 | 62.364 | 64.923 | 67.707 | 69.335 | 72.246 |
| BETA(PR) 7 | 33.673 | 46.543 | 54.452 | 55.874 | 58.853 |
| V 6 | 225.46 | 240.25 | 245.48 | 257.11 | 247.49 |
| V 7 | 396.71 | 375.37 | 365.32 | 387.20 | 396.76 |
| VZ 6 | 225.34 | 240.01 | 245.37 | 257.05 | 247.14 |
| VZ 7 | 264.90 | 240.62 | 233.84 | 273.84 | 290.31 |
| V-THETA 6 | 3.80 | 2.39 | -2.06 | -3.94 | -13.18 |
| V-THETA 7 | 293.76 | 287.80 | 280.52 | 273.67 | 270.44 |
| V(PR) 6 | 485.8 | 566.4 | 646.9 | 728.4 | 810.5 |
| V(PR) 7 | 320.4 | 350.4 | 402.5 | 488.2 | 561.3 |
| VTHETA PR6 | -430.4 | -512.9 | -598.5 | -681.5 | -771.9 |
| VTHETA PR7 | -177.6 | -254.3 | -327.5 | -404.2 | -480.4 |
| U 6 | 434.16 | 515.30 | 596.43 | 677.56 | 758.70 |
| U 7 | 471.39 | 542.13 | 608.03 | 677.84 | 750.81 |
| M 6 | 0.2028 | 0.2162 | 0.2210 | 0.2315 | 0.2228 |
| M 7 | 0.3522 | 0.3318 | 0.3219 | 0.3407 | 0.3479 |
| M(PR) 6 | 0.4370 | 0.5097 | 0.5823 | 0.6559 | 0.7295 |
| M(PR) 7 | 0.2844 | 0.3097 | 0.3547 | 0.4296 | 0.4922 |
| TURN(PR) | 28.680 | 18.360 | 13.247 | 13.458 | 13.393 |
| $\bar{\omega}$ | 0.1346 | 0.2803 | 0.3620 | 0.2696 | 0.3202 |
| DFAC | .5590 | .5794 | .5617 | .5001 | .4712 |
| EFFP | 1.0937 | 0.9790 | 0.9121 | 0.9195 | 0.8634 |
| EFF | 1.0959 | 0.9785 | 0.9100 | 0.9173 | 0.8595 |
| INCIDM | 13.764 | 12.423 | 11.607 | 9.735 | 9.046 |
| DEVM | 14.873 | 14.043 | 12.352 | 7.274 | 5.953 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70 PERCENT SPEED PT. 141 | SLTO | 4250. | 140. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.982 | 0.425 | -0.623 | -1.326 | -4.254 |
| V 3 | 214.12 | 225.98 | 233.45 | 237.40 | 237.48 |
| V 4 | 213.99 | 236.12 | 245.91 | 253.40 | 252.51 |
| VZ 3 | 214.12 | 225.61 | 233.44 | 237.39 | 237.47 |
| VZ 4 | 213.93 | 234.94 | 245.85 | 253.31 | 251.82 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 3.67 | 1.75 | -2.67 | -5.86 | -18.73 |
| M 3 | 0.1925 | 0.2033 | 0.2100 | 0.2136 | 0.2137 |
| M 4 | 0.1924 | 0.2125 | 0.2213 | 0.2282 | 0.2274 |
| TURN | -0.98 | -0.43 | 0.62 | 1.33 | 4.25 |
| $\bar{\omega}$ | 0.0210 | | 0.0195 | | 0.0200 |
| DFAC | 0.009 | -0.041 | -0.059 | -0.080 | -0.103 |
| EFFP | -0.0842 | 1.0569 | 0.8501 | 1.0329 | 0.8482 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.418 | 3.275 | 2.523 | 1.626 | 2.654 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.000 | 49.040 | 46.631 | 42.010 | 39.022 |
| BETA 10 | 5.319 | 2.240 | 1.247 | 1.707 | 3.636 |
| V 9 | 408.08 | 383.74 | 379.09 | 404.44 | 410.98 |
| V 10 | 241.49 | 275.49 | 279.92 | 316.25 | 362.89 |
| VZ 9 | 274.00 | 249.80 | 259.64 | 300.45 | 319.23 |
| VZ 10 | 237.87 | 273.08 | 273.05 | 316.01 | 362.10 |
| V-THETA 9 | 298.45 | 289.79 | 275.58 | 270.67 | 258.76 |
| V-THETA 10 | 22.38 | 10.77 | 6.09 | 9.42 | 23.01 |
| M 9 | 0.3622 | 0.3392 | 0.3343 | 0.3562 | 0.3609 |
| M 10 | 0.2126 | 0.2423 | 0.2456 | 0.2773 | 0.3179 |
| TURN | 41.682 | 46.801 | 45.384 | 40.302 | 35.386 |
| $\bar{\omega}$ | 0.0225 | 0.1370 | 0.1769 | 0.1704 | 0.0915 |
| DFAC | 0.6652 | 0.5805 | 0.5743 | 0.5204 | 0.3964 |
| EFFP | 0.4405 | 0.5643 | 0.4359 | 0.3406 | 0.4370 |
| INCIDM | 6.100 | 11.940 | 11.931 | 8.010 | 3.022 |
| DEVM | 14.019 | 9.740 | 8.747 | 9.707 | 12.536 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.854 | 0.260 | -0.632 | -1.270 | -4.221 |
| BETA 7 | 47.945 | 50.332 | 48.236 | 43.385 | 39.771 |
| BETA(PR) 6 | 61.270 | 64.021 | 66.658 | 68.413 | 71.377 |
| BETA(PR) 7 | 30.794 | 45.283 | 52.832 | 54.637 | 57.541 |
| V 6 | 235.90 | 250.50 | 258.41 | 270.24 | 262.60 |
| V 7 | 412.39 | 382.83 | 373.87 | 395.71 | 405.79 |
| VZ 6 | 235.79 | 250.24 | 258.31 | 270.14 | 261.88 |
| VZ 7 | 274.50 | 244.05 | 248.84 | 287.52 | 311.88 |
| V-THETA 6 | 3.51 | 1.14 | -2.85 | -5.99 | -19.33 |
| V-THETA 7 | 306.20 | 294.68 | 278.86 | 271.82 | 259.59 |
| V(PR) 6 | 490.6 | 571.4 | 652.0 | 734.3 | 820.1 |
| V(PR) 7 | 321.6 | 347.3 | 412.2 | 496.9 | 581.1 |
| VTHETA PR6 | -430.1 | -513.6 | -598.6 | -682.8 | -777.1 |
| VTHETA PR7 | -164.6 | -246.8 | -328.5 | -405.2 | -490.3 |
| U 6 | 433.65 | 514.69 | 595.73 | 676.77 | 757.81 |
| U 7 | 470.84 | 541.49 | 607.32 | 677.05 | 749.92 |
| M 6 | 0.2123 | 0.2255 | 0.2327 | 0.2435 | 0.2365 |
| M 7 | 0.3662 | 0.3383 | 0.3296 | 0.3484 | 0.3563 |
| M(PR) 6 | 0.4414 | 0.5144 | 0.5872 | 0.6616 | 0.7387 |
| M(PR) 7 | 0.2855 | 0.3070 | 0.3634 | 0.4375 | 0.5102 |
| TURN(PR) | 30.467 | 18.715 | 13.819 | 13.774 | 13.836 |
| $\bar{\omega}$ | 0.1270 | 0.2450 | 0.3129 | 0.2299 | 0.2722 |
| DFAC | .5704 | .5942 | .5497 | .4918 | .4507 |
| EFFP | 1.0500 | 0.9404 | 0.9112 | 0.9192 | 0.8823 |
| EFF | 1.0512 | 0.9390 | 0.9091 | 0.9170 | 0.8789 |
| INCIDM | 12.670 | 11.521 | 10.558 | 8.813 | 8.177 |
| DEVM | 11.994 | 12.783 | 10.732 | 6.037 | 4.641 |

Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70 PERCENT SPEED PT. 142 | SLTO | 4250. | 151.3 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.918 | 0.395 | -0.913 | -1.865 | -5.195 |
| V 3 | 230.32 | 243.85 | 252.68 | 257.26 | 257.17 |
| V 4 | 233.53 | 256.47 | 266.80 | 274.31 | 272.78 |
| VZ 3 | 230.31 | 243.48 | 252.67 | 257.25 | 257.16 |
| VZ 4 | 233.49 | 254.93 | 266.74 | 274.15 | 271.66 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 3.74 | 1.77 | -4.25 | -8.93 | -24.70 |
| M 3 | 0.2072 | 0.2195 | 0.2275 | 0.2317 | 0.2316 |
| M 4 | 0.2101 | 0.2310 | 0.2404 | 0.2472 | 0.2458 |
| TURN | -0.92 | -0.40 | 0.91 | 1.87 | 5.20 |
| $\bar{\omega}$ | 0.0196 | | 0.0197 | | 0.0280 |
| DFAC | -0.006 | -0.048 | -0.064 | -0.084 | -0.109 |
| EFFP | 0.5825 | 1.0600 | 0.8827 | 1.0221 | 0.7747 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.482 | 3.305 | 2.813 | 2.165 | 3.595 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 46.746 | 45.171 | 41.013 | 36.963 | 34.260 |
| BETA 10 | 6.511 | 1.885 | 1.235 | 1.602 | 3.648 |
| V 9 | 413.92 | 389.12 | 385.79 | 417.88 | 418.40 |
| V 10 | 263.64 | 298.77 | 308.29 | 343.75 | 379.03 |
| VZ 9 | 278.62 | 272.06 | 290.26 | 333.84 | 345.70 |
| VZ 10 | 259.39 | 295.87 | 307.25 | 343.53 | 378.16 |
| V-THETA 9 | 301.47 | 275.97 | 253.17 | 251.27 | 235.54 |
| V-THETA 10 | 29.90 | 9.82 | 6.65 | 9.61 | 24.12 |
| M 9 | 0.3674 | 0.3445 | 0.3410 | 0.3689 | 0.3686 |
| M 10 | 0.2322 | 0.2632 | 0.2714 | 0.3023 | 0.3332 |
| TURN | 40.235 | 43.286 | 39.777 | 35.361 | 30.612 |
| $\bar{\omega}$ | 0.2354 | 0.1041 | 0.1143 | 0.1083 | 0.0611 |
| DFAC | 0.6119 | 0.5129 | 0.4820 | 0.4481 | 0.3402 |
| EFFP | 0.4202 | 0.5934 | 0.5266 | 0.4318 | 0.7182 |
| INCIDM | 5.846 | 8.071 | 6.313 | 2.963 | -1.740 |
| DEVM | 15.211 | 9.385 | 8.735 | 9.602 | 12.548 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.804 | 0.302 | -0.882 | -1.757 | -5.270 |
| BETA 7 | 47.872 | 46.606 | 42.636 | 38.590 | 34.378 |
| BETA(PR) 6 | 59.425 | 62.107 | 64.801 | 66.776 | 70.246 |
| BETA(PR) 7 | 29.699 | 44.326 | 51.576 | 53.313 | 56.821 |
| V 6 | 254.20 | 271.97 | 282.48 | 294.43 | 282.65 |
| V 7 | 418.80 | 387.42 | 378.46 | 404.72 | 410.49 |
| VZ 6 | 254.10 | 271.68 | 282.37 | 294.27 | 281.46 |
| VZ 7 | 279.27 | 265.85 | 278.25 | 316.28 | 338.79 |
| V-THETA 6 | 3.57 | 1.43 | -4.35 | -9.03 | -25.96 |
| V-THETA 7 | 310.60 | 281.52 | 256.34 | 252.44 | 231.79 |
| V(PR) 6 | 499.6 | 580.9 | 663.2 | 746.3 | 832.8 |
| V(PR) 7 | 323.4 | 372.1 | 448.0 | 529.5 | 619.1 |
| VTHETA PR6 | -430.1 | -513.3 | -600.1 | -685.8 | -783.8 |
| VTHETA PR7 | -160.2 | -260.0 | -351.0 | -424.6 | -518.1 |
| U 6 | 433.65 | 514.69 | 595.73 | 676.77 | 757.81 |
| U 7 | 470.84 | 541.49 | 607.32 | 677.05 | 749.92 |
| M 6 | 0.2289 | 0.2451 | 0.2547 | 0.2656 | 0.2548 |
| M 7 | 0.3719 | 0.3429 | 0.3344 | 0.3571 | 0.3615 |
| M(PR) 6 | 0.4498 | 0.5234 | 0.5979 | 0.6732 | 0.7508 |
| M(PR) 7 | 0.2872 | 0.3293 | 0.3959 | 0.4672 | 0.5451 |
| TURN(PR) | 29.718 | 17.756 | 13.219 | 13.461 | 13.426 |
| $\bar{\omega}$ | 0.1141 | 0.2111 | 0.2370 | 0.1804 | 0.1974 |
| DFAC | .5785 | .5488 | .4893 | .4464 | .4023 |
| EFFP | 1.0208 | 0.9655 | 0.9613 | 0.9617 | 0.9326 |
| EFF | 1.0212 | 0.9647 | 0.9604 | 0.9607 | 0.9307 |
| INCIDM | 10.825 | 9.607 | 8.701 | 7.176 | 7.046 |
| DEVM | 10.899 | 11.826 | 9.476 | 4.713 | 3.921 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70 PERCENT SPEED PT. 143 | SLTO | 4255. | 171.3 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.987 | 0.444 | -0.424 | -1.494 | -4.780 |
| V 3 | 260.21 | 276.65 | 287.95 | 294.28 | 295.33 |
| V 4 | 269.90 | 293.28 | 304.54 | 314.98 | 309.70 |
| VZ 3 | 260.19 | 276.31 | 287.93 | 294.26 | 295.32 |
| VZ 4 | 269.86 | 291.01 | 304.53 | 314.87 | 308.63 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 4.65 | 2.27 | -2.25 | -8.21 | -25.81 |
| M 3 | 0.2344 | 0.2493 | 0.2597 | 0.2654 | 0.2664 |
| M 4 | 0.2432 | 0.2645 | 0.2748 | 0.2844 | 0.2796 |
| TURN | -0.99 | -0.44 | 0.42 | 1.49 | 4.78 |
| $\bar{\omega}$ | 0.0199 | | 0.0216 | | 0.032 |
| DFAC | -0.028 | -0.056 | -0.062 | -0.084 | -0.092 |
| EFFP | 0.7169 | 0.9698 | 0.8296 | 1.0426 | 0.7068 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.413 | 3.256 | 2.324 | 1.794 | 3.180 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 43.432 | 37.720 | 35.157 | 32.729 | 29.005 |
| BETA 10 | 4.192 | 1.087 | 0.871 | -0.258 | 1.669 |
| V 9 | 423.95 | 404.56 | 412.28 | 423.91 | 423.95 |
| V 10 | 325.14 | 343.27 | 359.27 | 384.88 | 413.62 |
| VZ 9 | 301.72 | 316.86 | 335.84 | 356.42 | 370.76 |
| VZ 10 | 321.82 | 339.55 | 357.83 | 384.63 | 413.43 |
| V-THETA 9 | 291.46 | 247.51 | 237.39 | 229.19 | 205.57 |
| V-THETA 10 | 23.77 | 6.51 | 5.46 | -1.73 | 12.05 |
| M 9 | 0.3769 | 0.3593 | 0.3656 | 0.3753 | 0.3746 |
| M 10 | 0.2874 | 0.3038 | 0.3176 | 0.3400 | 0.3652 |
| TURN | 39.240 | 36.633 | 34.285 | 32.986 | 27.336 |
| $\bar{\omega}$ | 0.1676 | 0.0189 | 0.0567 | 0.0303 | 0.0253 |
| DFAC | 0.4728 | 0.3960 | 0.3760 | 0.3471 | 0.2466 |
| EFFP | 0.4739 | 0.5314 | 0.3883 | 0.2866 | 0.0131 |
| INCIDM | 2.532 | .620 | .457 | -1.271 | -6.995 |
| DEVM | 12.892 | 8.587 | 8.371 | 7.742 | 10.569 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.870 | 0.352 | -0.386 | -1.450 | -4.753 |
| BETA 7 | 44.845 | 39.393 | 36.554 | 34.272 | 30.345 |
| BETA(PR) 6 | 55.980 | 58.742 | 61.580 | 63.946 | 67.596 |
| BETA(PR) 7 | 29.177 | 43.025 | 48.668 | 52.731 | 56.905 |
| V 6 | 290.20 | 311.99 | 324.00 | 335.54 | 325.00 |
| V 7 | 428.12 | 399.82 | 402.96 | 411.03 | 410.43 |
| VZ 6 | 290.10 | 311.63 | 323.94 | 335.42 | 323.88 |
| VZ 7 | 302.03 | 308.68 | 323.53 | 339.62 | 354.20 |
| V-THETA 6 | 4.41 | 1.91 | -2.18 | -8.49 | -26.93 |
| V-THETA 7 | 301.90 | 253.74 | 239.99 | 231.46 | 207.35 |
| V(PR) 6 | 518.5 | 600.7 | 680.7 | 763.7 | 849.8 |
| V(PR) 7 | 347.7 | 422.7 | 490.1 | 560.9 | 648.7 |
| VTHETA PR6 | -429.8 | -513.4 | -598.6 | -686.1 | -785.6 |
| VTHETA PR7 | -169.5 | -288.4 | -368.0 | -446.4 | -543.5 |
| U 6 | 434.16 | 515.30 | 596.43 | 677.56 | 758.70 |
| U 7 | 471.39 | 542.13 | 608.03 | 677.84 | 750.81 |
| M 6 | 0.2617 | 0.2817 | 0.2927 | 0.3033 | 0.2936 |
| M 7 | 0.3807 | 0.3550 | 0.3572 | 0.3637 | 0.3624 |
| M(PR) 6 | 0.4677 | 0.5424 | 0.6149 | 0.6903 | 0.7677 |
| M(PR) 7 | 0.3091 | 0.3753 | 0.4345 | 0.4963 | 0.5727 |
| TURN(PR) | 26.796 | 15.688 | 12.908 | 11.213 | 10.690 |
| $\bar{\omega}$ | 0.0988 | 0.1239 | 0.1091 | 0.0987 | 0.1148 |
| DFAC | .5396 | .4611 | .4133 | .4062 | .3665 |
| EFFP | 1.0110 | 1.0564 | 1.0520 | 1.0159 | 0.9922 |
| EFF | 1.0113 | 1.0576 | 1.0532 | 1.0163 | 0.9919 |
| INCIDM | 7.380 | 6.242 | 5.480 | 4.346 | 4.396 |
| DEVM | 10.377 | 10.525 | 6.568 | 4.131 | 4.005 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70 PERCENT SPEED PT. 144 | SLTO | 4255. | 187.2 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.891 | 0.275 | -0.828 | -1.693 | -4.454 |
| V 3 | 288.13 | 305.89 | 317.51 | 323.43 | 323.91 |
| V 4 | 300.27 | 324.89 | 336.27 | 344.71 | 339.68 |
| VZ 3 | 288.10 | 305.52 | 317.48 | 323.41 | 323.89 |
| VZ 4 | 300.23 | 322.75 | 336.23 | 344.56 | 338.65 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 4.67 | 1.56 | -4.86 | -10.18 | -26.38 |
| M 3 | 0.2598 | 0.2761 | 0.2867 | 0.2922 | 0.2926 |
| M 4 | 0.2709 | 0.2935 | 0.3040 | 0.3118 | 0.3071 |
| TURN | -0.89 | -0.27 | 0.83 | 1.69 | 4.45 |
| $\bar{\omega}$ | 0.0213 | | 0.0191 | | 0.027 |
| DFAC | -0.034 | -0.060 | -0.067 | -0.082 | -0.089 |
| EFFP | 0.8244 | 0.9939 | 0.8608 | 1.0135 | 0.7361 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.509 | 3.425 | 2.728 | 1.993 | 2.854 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.783 | 0.186 | -0.786 | -1.669 | -4.373 |
| BETA 7 | 38.029 | 33.782 | 30.616 | 28.315 | 24.638 |
| BETA(PR) 6 | 52.825 | 55.895 | 59.185 | 61.970 | 65.908 |
| BETA(PR) 7 | 27.627 | 40.073 | 46.991 | 51.610 | 55.126 |
| V 6 | 325.97 | 348.49 | 358.79 | 366.58 | 352.28 |
| V 7 | 458.41 | 431.88 | 424.65 | 427.54 | 436.23 |
| VZ 6 | 325.87 | 348.18 | 358.70 | 366.41 | 351.26 |
| VZ 7 | 359.44 | 358.63 | 365.28 | 376.33 | 396.51 |
| V-THETA 6 | 4.46 | 1.13 | -4.92 | -10.67 | -26.85 |
| V-THETA 7 | 282.40 | 240.14 | 216.26 | 202.79 | 181.86 |
| V(PR) 6 | 539.3 | 621.1 | 700.2 | 779.7 | 860.5 |
| V(PR) 7 | 407.6 | 469.1 | 535.8 | 606.1 | 693.5 |
| VTHETA PR6 | -429.7 | -514.2 | -601.4 | -688.2 | -785.6 |
| VTHETA PR7 | -189.0 | -302.0 | -391.8 | -475.0 | -569.0 |
| U 6 | 434.16 | 515.30 | 596.43 | 677.56 | 758.70 |
| U 7 | 471.39 | 542.13 | 608.03 | 677.84 | 750.81 |
| M 6 | 0.2945 | 0.3152 | 0.3248 | 0.3320 | 0.3187 |
| M 7 | 0.4091 | 0.3847 | 0.3777 | 0.3798 | 0.3869 |
| M(PR) 6 | 0.4873 | 0.5619 | 0.6338 | 0.7061 | 0.7786 |
| M(PR) 7 | 0.3637 | 0.4178 | 0.4766 | 0.5383 | 0.6151 |
| TURN(PR) | 25.192 | 15.799 | 12.190 | 10.359 | 10.782 |
| $\bar{\omega}$ | 0.0862 | 0.0772 | 0.0823 | 0.0912 | 0.1120 |
| DFAC | .5022 | .3965 | .3678 | .3452 | .3078 |
| EFFP | 1.0078 | 1.0195 | 1.0188 | 0.9928 | 0.9941 |
| EFF | 1.0079 | 1.0199 | 1.0192 | 0.9926 | 0.9940 |
| INCIDM | 4.225 | 3.395 | 3.085 | 2.370 | 2.708 |
| DEVM | 8.827 | 7.573 | 4.891 | 3.010 | 2.226 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 36.247 | 32.121 | 29.374 | 27.047 | 24.385 |
| BETA 10 | 2.280 | 0.458 | 0.549 | -0.576 | 1.032 |
| V 9 | 460.43 | 440.56 | 435.90 | 440.42 | 443.00 |
| V 10 | 410.63 | 398.19 | 404.44 | 414.18 | 436.08 |
| VZ 9 | 364.60 | 370.09 | 378.90 | 392.18 | 403.43 |
| VZ 10 | 407.83 | 394.79 | 403.40 | 414.07 | 435.93 |
| V-THETA 9 | 272.24 | 234.24 | 213.81 | 200.27 | 182.90 |
| V-THETA 10 | 16.33 | 3.18 | 3.88 | -4.16 | 7.85 |
| M 9 | 0.4110 | 0.3927 | 0.3880 | 0.3915 | 0.3931 |
| M 10 | 0.3653 | 0.3539 | 0.3592 | 0.3675 | 0.3868 |
| TURN | 33.967 | 31.663 | 28.825 | 27.623 | 23.353 |
| $\bar{\omega}$ | 0.1514 | 0.0405 | 0.0455 | 0.205 | 0.0201 |
| DFAC | 0.3194 | 0.3115 | 0.2840 | 0.2769 | 0.2080 |
| EFFP | 0.6005 | 0.4975 | 0.4429 | 0.2585 | -0.3022 |
| INCIDM | -4.653 | -4.979 | -5.326 | -6.953 | -11.615 |
| DEVM | 10.980 | 7.958 | 8.049 | 7.424 | 9.932 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70 PERCENT SPEED | PT.139 | SLTO | 4260. | 207. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 0.960 | 0.344 | -0.866 | -1.839 | -3.970 |
| V 3 | 323.81 | 343.06 | 354.75 | 360.03 | 359.84 |
| V 4 | 336.82 | 363.85 | 376.09 | 384.09 | 379.10 |
| VZ 3 | 323.76 | 342.64 | 354.71 | 360.01 | 359.81 |
| VZ 4 | 336.76 | 361.93 | 376.02 | 383.88 | 378.19 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 5.64 | 2.19 | -5.68 | -12.32 | -26.25 |
| M 3 | 0.2925 | 0.3102 | 0.3210 | 0.3259 | 0.3257 |
| M 4 | 0.3045 | 0.3294 | 0.3408 | 0.3482 | 0.3436 |
| TURN | -0.96 | -0.34 | 0.87 | 1.84 | 3.97 |
| $\bar{\omega}$ | 0.0219 | | 0.0188 | | 0.0250 |
| DFAC | -0.031 | -0.057 | -0.068 | -0.084 | -0.090 |
| EFFP | 0.7928 | 0.9298 | 0.8270 | 0.9917 | 0.7970 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.440 | 3.356 | 2.766 | 2.139 | 2.370 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 27.739 | 24.050 | 21.461 | 18.634 | 15.594 |
| BETA 10 | 1.597 | 0.556 | 0.212 | -0.325 | 1.833 |
| V 9 | 509.07 | 489.18 | 473.48 | 467.78 | 462.05 |
| V 10 | 509.30 | 486.00 | 474.36 | 468.22 | 469.56 |
| VZ 9 | 443.27 | 443.96 | 440.03 | 443.25 | 444.92 |
| VZ 10 | 506.28 | 482.93 | 473.72 | 468.21 | 469.15 |
| V-THETA 9 | 236.94 | 199.35 | 173.23 | 149.47 | 124.21 |
| V-THETA 10 | 14.19 | 4.71 | 1.76 | -2.66 | 15.02 |
| M 9 | 0.4574 | 0.4389 | 0.4242 | 0.4188 | 0.4132 |
| M 10 | 0.4576 | 0.4359 | 0.4250 | 0.4193 | 0.4202 |
| TURN | 26.142 | 23.494 | 21.248 | 18.960 | 13.761 |
| $\bar{\omega}$ | 0.0418 | 0.0279 | 0.0213 | 0.0178 | 0.0315 |
| DFAC | 0.1659 | 0.1698 | 0.1575 | 0.1513 | 0.0989 |
| EFFP | 70.4983 | -6.0340 | 24.2595 | 36.6491 | 2.6005 |
| INCIDM | -13.161 | -13.050 | -13.239 | -15.366 | -20.406 |
| DEVM | 10.297 | 8.056 | 7.712 | 7.675 | 10.733 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.832 | 0.204 | -0.845 | -1.774 | -3.971 |
| BETA 7 | 29.596 | 25.612 | 22.628 | 19.678 | 16.128 |
| BETA(PR) 6 | 49.231 | 52.484 | 56.223 | 59.482 | 63.792 |
| BETA(PR) 7 | 27.520 | 38.413 | 45.491 | 51.072 | 54.942 |
| V 6 | 370.29 | 395.30 | 403.51 | 407.54 | 388.06 |
| V 7 | 498.40 | 473.07 | 459.88 | 451.67 | 456.46 |
| VZ 6 | 370.16 | 395.01 | 403.38 | 407.32 | 387.13 |
| VZ 7 | 431.47 | 426.17 | 424.26 | 425.23 | 438.49 |
| V-THETA 6 | 5.38 | 1.41 | -5.95 | -12.62 | -26.87 |
| V-THETA 7 | 246.15 | 204.50 | 176.94 | 152.09 | 126.80 |
| V(PR) 6 | 566.9 | 648.8 | 725.6 | 802.1 | 876.5 |
| V(PR) 7 | 488.7 | 544.4 | 605.5 | 676.9 | 763.4 |
| VTHETA PR6 | -429.3 | -514.5 | -603.1 | -691.0 | -786.5 |
| VTHETA PR7 | -225.8 | -338.3 | -431.8 | -526.5 | -624.9 |
| U 6 | 434.67 | 515.90 | 597.13 | 678.36 | 759.59 |
| U 7 | 471.94 | 542.76 | 608.75 | 678.64 | 751.69 |
| M 6 | 0.3354 | 0.3586 | 0.3663 | 0.3700 | 0.3519 |
| M 7 | 0.4474 | 0.4239 | 0.4116 | 0.4039 | 0.4081 |
| M(PR) 6 | 0.5135 | 0.5886 | 0.6586 | 0.7283 | 0.7949 |
| M(PR) 7 | 0.4387 | 0.4878 | 0.5419 | 0.6053 | 0.6825 |
| TURN(PR) | 21.704 | 14.051 | 10.727 | 8.408 | 8.849 |
| $\bar{\omega}$ | 0.0589 | 0.0530 | 0.0726 | 0.0876 | 0.1113 |
| DFAC | .2939 | .2842 | .2719 | .2476 | .2114 |
| EFFP | 1.0542 | 1.0482 | 1.0329 | 1.0023 | 1.0068 |
| EFF | 1.0552 | 1.0491 | 1.0335 | 1.0023 | 1.0070 |
| INCIDM | .631 | -.016 | .123 | -.118 | .592 |
| DEVM | 8.720 | 5.913 | 3.391 | 2.472 | 2.042 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 80 PERCENT SPEED | PT. 137 | SLTO | 4815. | 157.3 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 2.414 | 1.800 | 0.611 | -0.446 | -1.657 |
| V 3 | 243.97 | 256.99 | 264.24 | 267.32 | 266.65 |
| V 4 | 241.01 | 265.16 | 277.42 | 286.32 | 285.70 |
| VZ 3 | 243.96 | 256.51 | 264.23 | 267.31 | 266.64 |
| VZ 4 | 240.74 | 263.94 | 277.25 | 286.23 | 285.57 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 10.15 | 8.33 | 2.96 | -2.23 | -8.26 |
| M 3 | 0.2196 | 0.2314 | 0.2380 | 0.2408 | 0.2402 |
| M 4 | 0.2169 | 0.2389 | 0.2500 | 0.2582 | 0.2576 |
| TURN | -2.41 | -1.80 | -0.61 | 0.45 | 1.66 |
| $\bar{\omega}$ | | (REFER TO 70% & 100% SPEED DATA) | | | |
| DFAC | 0.033 | -0.015 | -0.044 | -0.075 | -0.087 |
| EFFP | -3.5686 | 0.8482 | 0.7890 | 0.9801 | 0.8348 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 2.986 | 1.900 | 1.289 | .746 | .057 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 48.166 | 49.802 | 48.840 | 45.068 | 42.220 |
| BETA 10 | 2.534 | 2.107 | 0.543 | 1.529 | 4.834 |
| V 9 | 474.23 | 454.64 | 443.18 | 465.52 | 477.51 |
| V 10 | 266.33 | 312.99 | 304.14 | 344.36 | 402.59 |
| VZ 9 | 311.86 | 291.97 | 291.30 | 328.78 | 353.50 |
| VZ 10 | 262.98 | 310.96 | 303.65 | 344.22 | 401.02 |
| V-THETA 9 | 353.34 | 347.26 | 333.66 | 329.56 | 320.88 |
| V-THETA 10 | 11.77 | 11.51 | 2.88 | 9.19 | 33.93 |
| M 9 | 0.4199 | 0.4004 | 0.3887 | 0.4073 | 0.4165 |
| M 10 | 0.2331 | 0.2736 | 0.2648 | 0.2993 | 0.3496 |
| TURN | 45.633 | 47.695 | 48.298 | 43.538 | 37.386 |
| $\bar{\omega}$ | 0.2278 | 0.1577 | 0.1733 | 0.0967 | 0.1049 |
| DFAC | 0.7125 | 0.6147 | 0.6421 | 0.5824 | 0.4496 |
| EFFP | 0.4476 | 0.5617 | 0.4357 | 0.3897 | 0.4939 |
| INCIDM | 7.266 | 12.702 | 14.140 | 11.068 | 6.220 |
| DEVM | 11.234 | 9.607 | 8.043 | 9.529 | 13.734 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 2.104 | 1.549 | 0.424 | -0.470 | -1.967 |
| BETA 7 | 49.203 | 51.105 | 50.062 | 46.436 | 43.319 |
| BETA(PR) 6 | 60.956 | 63.663 | 66.453 | 68.431 | 71.282 |
| BETA(PR) 7 | 28.727 | 42.596 | 51.196 | 54.187 | 57.106 |
| V 6 | 267.67 | 285.22 | 293.32 | 304.15 | 294.30 |
| V 7 | 478.35 | 452.55 | 439.64 | 456.66 | 469.16 |
| VZ 6 | 267.37 | 284.84 | 293.18 | 304.09 | 294.15 |
| VZ 7 | 310.47 | 283.71 | 281.98 | 314.61 | 341.32 |
| V-THETA 6 | 9.82 | 7.71 | 2.17 | -2.49 | -9.59 |
| V-THETA 7 | 362.12 | 352.21 | 337.09 | 330.90 | 321.87 |
| V(PR) 6 | 550.8 | 642.2 | 733.9 | 827.2 | 916.6 |
| V(PR) 7 | 356.4 | 386.0 | 450.4 | 537.8 | 628.5 |
| VTHETA PR6 | -481.5 | -575.4 | -672.8 | -769.2 | -868.1 |
| VTHETA PR7 | -171.3 | -261.3 | -351.0 | -436.2 | -527.7 |
| U 6 | 491.30 | 583.12 | 674.93 | 766.74 | 858.55 |
| U 7 | 533.43 | 613.47 | 688.06 | 767.05 | 849.62 |
| M 6 | 0.2412 | 0.2572 | 0.2646 | 0.2745 | 0.2655 |
| M 7 | 0.4237 | 0.3985 | 0.3856 | 0.3995 | 0.4091 |
| M(PR) 6 | 0.4962 | 0.5790 | 0.6620 | 0.7465 | 0.8268 |
| M(PR) 7 | 0.3157 | 0.3399 | 0.3951 | 0.4705 | 0.5480 |
| TURN(PR) | 32.219 | 21.045 | 15.248 | 14.240 | 14.176 |
| $\bar{\omega}$ | 0.1258 | 0.2678 | 0.3319 | 0.2699 | 0.2557 |
| DFAC | .5880 | .6104 | .5780 | .5299 | .4837 |
| EFFP | 1.0354 | 0.9370 | 0.8850 | 0.8720 | 0.8460 |
| EFF | 1.0365 | 0.9350 | 0.8813 | 0.8675 | 0.8403 |
| INCIDM | 12.356 | 11.163 | 10.353 | 8.831 | 8.082 |
| DEVM | 9.927 | 10.096 | 9.096 | 5.587 | 4.206 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80 PERCENT SPEED PT. 133 | SLTO | 4820. | 164.0 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 2.355 | 2.140 | 0.531 | 0.093 | -2.023 |
| V 3 | 250.80 | 265.14 | 274.71 | 280.43 | 282.01 |
| V 4 | 254.41 | 276.29 | 291.84 | 298.62 | 297.07 |
| VZ 3 | 250.79 | 264.74 | 274.70 | 280.42 | 282.00 |
| VZ 4 | 254.18 | 274.45 | 291.81 | 298.62 | 296.88 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 10.45 | 10.31 | 2.71 | 0.49 | -10.49 |
| M 3 | 0.2258 | 0.2388 | 0.2476 | 0.2528 | 0.2542 |
| M 4 | 0.2291 | 0.2490 | 0.2632 | 0.2694 | 0.2680 |
| TURN | -2.35 | -2.14 | -0.53 | -0.09 | 2.02 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.007 | -0.022 | -0.057 | -0.064 | -0.072 |
| EFFP | -2.2464 | 1.3886 | 1.1912 | 1.1254 | 0.9722 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 3.045 | 1.560 | 1.369 | .207 | .423 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 48.594 | 47.954 | 46.492 | 42.869 | 37.905 |
| BETA 10 | 3.984 | 2.670 | 1.012 | 2.155 | 0.467 |
| V 9 | 444.50 | 433.82 | 415.91 | 444.50 | 470.68 |
| V 10 | 261.26 | 307.46 | 324.39 | 354.25 | 424.76 |
| VZ 9 | 268.86 | 288.16 | 285.25 | 325.49 | 371.38 |
| VZ 10 | 257.82 | 304.16 | 322.95 | 353.62 | 424.75 |
| V-THETA 9 | 333.39 | 322.16 | 301.65 | 302.40 | 289.16 |
| V-THETA 10 | 18.15 | 14.32 | 5.73 | 13.32 | 3.46 |
| M 9 | 0.3933 | 0.3825 | 0.3654 | 0.3897 | 0.4121 |
| M 10 | 0.2289 | 0.2693 | 0.2836 | 0.3090 | 0.3708 |
| TURN | 44.610 | 45.284 | 45.481 | 40.715 | 37.438 |
| $\bar{\omega}$ | 0.2099 | 0.1264 | 0.1400 | 0.1473 | 0.0729 |
| DFAC | 0.6819 | 0.5824 | 0.5331 | 0.5075 | 0.3930 |
| EFFP | 0.4053 | 0.4323 | 0.4840 | 0.2303 | 0.1149 |
| INCIDM | 7.694 | 10.854 | 11.792 | 8.869 | 1.905 |
| DEVM | 12.684 | 10.170 | 8.512 | 10.155 | 9.367 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 2.080 | 1.927 | 0.425 | 0.056 | -1.959 |
| BETA 7 | 49.464 | 49.353 | 47.906 | 44.554 | 39.847 |
| BETA(PR) 6 | 60.078 | 62.964 | 65.630 | 67.586 | 70.094 |
| BETA(PR) 7 | 33.106 | 45.433 | 54.169 | 56.329 | 58.269 |
| V 6 | 277.52 | 293.33 | 305.10 | 316.46 | 315.30 |
| V 7 | 451.08 | 432.45 | 412.33 | 433.51 | 451.83 |
| VZ 6 | 277.26 | 292.85 | 305.02 | 316.44 | 315.11 |
| VZ 7 | 291.38 | 281.36 | 276.24 | 308.86 | 346.89 |
| V-THETA 6 | 10.07 | 9.86 | 2.27 | 0.31 | -10.78 |
| V-THETA 7 | 342.82 | 328.12 | 305.97 | 304.14 | 289.51 |
| V(PR) 6 | 555.9 | 644.4 | 739.3 | 829.9 | 925.5 |
| V(PR) 7 | 350.0 | 401.4 | 472.2 | 557.2 | 659.6 |
| VTHETA PR6 | -481.7 | -573.9 | -673.4 | -767.2 | -870.2 |
| VTHETA PR7 | -191.2 | -286.0 | -382.8 | -463.7 | -561.0 |
| U 6 | 491.81 | 583.72 | 675.63 | 767.53 | 859.44 |
| U 7 | 533.98 | 614.11 | 688.77 | 767.85 | 850.50 |
| M 6 | 0.2501 | 0.2646 | 0.2754 | 0.2858 | 0.2847 |
| M 7 | 0.3994 | 0.3813 | 0.3623 | 0.3800 | 0.3951 |
| M(PR) 6 | 0.5010 | 0.5813 | 0.6672 | 0.7495 | 0.8357 |
| M(PR) 7 | 0.3099 | 0.3539 | 0.4148 | 0.4884 | 0.5768 |
| TURN(PR) | 26.964 | 17.506 | 11.456 | 11.256 | 11.825 |
| $\bar{\omega}$ | 0.1563 | 0.2292 | 0.2976 | 0.2138 | 0.1668 |
| DFAC | .5900 | .5717 | .5338 | .4924 | .4393 |
| EFFP | 1.0734 | 1.0242 | 0.9644 | 0.9594 | 0.9557 |
| EFF | 1.0756 | 1.0249 | 0.9633 | 0.9579 | 0.9540 |
| INCIDM | 11.478 | 10.464 | 9.530 | 7.986 | 6.894 |
| DEVM | 14.306 | 12.933 | 12.069 | 7.729 | 5.369 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80 PERCENT SPEED PT. 134 | SLTO | 4845. | 176.8 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 2.186 | 1.777 | 0.469 | -0.281 | -1.428 |
| V 3 | 273.06 | 288.54 | 298.24 | 303.37 | 303.12 |
| V 4 | 274.15 | 301.47 | 315.62 | 323.95 | 325.26 |
| VZ 3 | 273.05 | 288.05 | 298.23 | 303.35 | 303.10 |
| VZ 4 | 273.92 | 299.78 | 315.53 | 323.90 | 325.15 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 10.46 | 9.35 | 2.58 | -1.59 | -8.11 |
| M 3 | 0.2461 | 0.2602 | 0.2691 | 0.2738 | 0.2735 |
| M 4 | 0.2471 | 0.2720 | 0.2850 | 0.2927 | 0.2939 |
| TURN | -2.19 | -1.78 | -0.47 | 0.28 | 1.43 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.016 | -0.028 | -0.054 | -0.070 | -0.086 |
| EFFP | 0.1121 | 0.7070 | 0.7142 | 0.8453 | 0.7804 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 3.214 | 1.923 | 1.431 | .581 | -.172 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 1.915 | 1.577 | 0.357 | -0.282 | -1.584 |
| BETA 7 | 46.950 | 46.156 | 43.625 | 38.371 | 36.149 |
| BETA(PR) 6 | 58.180 | 60.950 | 63.811 | 65.702 | 68.957 |
| BETA(PR) 7 | 27.711 | 43.004 | 52.123 | 52.626 | 55.569 |
| V 6 | 300.80 | 321.44 | 333.13 | 349.15 | 326.07 |
| V 7 | 492.74 | 451.48 | 427.22 | 468.59 | 483.60 |
| VZ 6 | 300.52 | 320.99 | 333.00 | 349.10 | 335.94 |
| VZ 7 | 334.22 | 312.30 | 309.02 | 367.27 | 390.48 |
| V-THETA 6 | 10.05 | 8.85 | 2.07 | -1.72 | -9.29 |
| V-THETA 7 | 360.07 | 325.62 | 294.75 | 290.87 | 285.27 |
| V(PR) 6 | 570.0 | 661.2 | 754.6 | 848.4 | 935.6 |
| V(PR) 7 | 379.9 | 427.6 | 503.7 | 605.2 | 690.6 |
| VTHETA PR6 | -484.3 | -577.9 | -677.1 | -773.2 | -873.2 |
| VTHETA PR7 | -176.7 | -291.7 | -397.6 | -481.0 | -569.6 |
| U 6 | 494.37 | 586.75 | 679.13 | 771.52 | 863.93 |
| U 7 | 536.75 | 617.30 | 692.34 | 771.83 | 854.91 |
| M 6 | 0.2714 | 0.2903 | 0.3011 | 0.3159 | 0.3038 |
| M 7 | 0.4369 | 0.3986 | 0.3761 | 0.4122 | 0.4242 |
| M(PR) 6 | 0.5144 | 0.5973 | 0.6820 | 0.7675 | 0.8457 |
| M(PR) 7 | 0.3369 | 0.3775 | 0.4434 | 0.5323 | 0.6058 |
| TURN(PR) | 30.459 | 17.922 | 11.679 | 13.073 | 13.387 |
| $\bar{\omega}$ | 0.1203 | 0.2091 | 0.2195 | 0.1576 | 0.1386 |
| DFAC | .5596 | .5418 | .4951 | .4409 | .4097 |
| EFFP | 1.0517 | 0.9817 | 0.9448 | 0.9667 | 0.9322 |
| EFF | 1.0533 | 0.9812 | 0.9432 | 0.9656 | 0.9295 |
| INCIDM | 9.580 | 8.450 | 7.711 | 6.102 | 5.757 |
| DEVM | 8.911 | 10.504 | 10.023 | 4.026 | 2.669 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 45.863 | 44.769 | 41.831 | 36.501 | 35.818 |
| BETA 10 | 7.367 | 1.955 | 0.797 | 1.469 | 2.613 |
| V 9 | 487.45 | 453.81 | 436.14 | 487.67 | 492.37 |
| V 10 | 296.96 | 340.43 | 347.23 | 393.55 | 439.24 |
| VZ 9 | 333.93 | 319.87 | 324.15 | 391.97 | 399.08 |
| VZ 10 | 291.27 | 337.46 | 346.26 | 393.36 | 438.63 |
| V-THETA 9 | 349.83 | 319.59 | 290.88 | 290.08 | 288.14 |
| V-THETA 10 | 38.08 | 11.62 | 4.83 | 10.09 | 20.02 |
| M 9 | 0.4320 | 0.4007 | 0.3841 | 0.4294 | 0.4320 |
| M 10 | 0.2602 | 0.2986 | 0.3042 | 0.3445 | 0.3842 |
| TURN | 38.496 | 42.814 | 41.034 | 35.032 | 33.205 |
| $\bar{\omega}$ | 0.2182 | 0.0190 | 0.0960 | 0.0828 | 0.0384 |
| DFAC | 0.6332 | 0.5284 | 0.4924 | 0.4618 | 0.3731 |
| EFFP | 0.4286 | 0.6723 | 0.7977 | 0.6728 | 1.2023 |
| INCIDM | 4.963 | 7.669 | 7.131 | 2.501 | -.182 |
| DEVM | 16.067 | 9.455 | 8.297 | 9.469 | 11.513 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80 PERCENT SPEED PT. 135 | SLTO | 4850. | 198.6 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 2.248 | 1.755 | 0.320 | -0.320 | -2.432 |
| V 3 | 306.61 | 325.57 | 338.66 | 345.53 | 346.11 |
| V 4 | 315.17 | 339.75 | 359.17 | 368.26 | 368.55 |
| VZ 3 | 306.59 | 325.07 | 338.65 | 345.51 | 346.09 |
| VZ 4 | 314.92 | 337.26 | 359.14 | 368.23 | 368.22 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 12.36 | 10.40 | 2.01 | -2.06 | -15.64 |
| M 3 | 0.2767 | 0.2941 | 0.3062 | 0.3125 | 0.3130 |
| M 4 | 0.2846 | 0.3072 | 0.3251 | 0.3335 | 0.3338 |
| TURN | -2.25 | -1.75 | -0.32 | 0.32 | 2.43 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.007 | -0.027 | -0.058 | -0.069 | -0.087 |
| EFFP | 0.6211 | 0.7399 | 0.9946 | 1.1072 | 0.9970 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 3.152 | 1.945 | 1.580 | -.020 | .832 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 46.161 | 40.347 | 37.202 | 34.312 | 31.783 |
| BETA 10 | 4.224 | C.960 | 0.344 | -0.561 | 2.341 |
| V 9 | 516.03 | 490.39 | 493.67 | 521.66 | 524.74 |
| V 10 | 358.69 | 388.17 | 409.09 | 438.84 | 475.53 |
| VZ 9 | 350.44 | 370.31 | 392.02 | 430.80 | 445.95 |
| VZ 10 | 354.53 | 384.32 | 407.79 | 438.70 | 475.02 |
| V-THETA 9 | 372.21 | 317.49 | 298.49 | 294.06 | 276.39 |
| V-THETA 10 | 26.42 | 6.50 | 2.45 | -4.30 | 19.43 |
| M 9 | 0.4575 | 0.4343 | 0.4361 | 0.4603 | 0.4616 |
| M 10 | 0.3146 | 0.3414 | 0.3593 | 0.3849 | 0.4169 |
| TURN | 41.937 | 39.387 | 36.858 | 34.873 | 29.442 |
| $\bar{\omega}$ | 0.01853 | 0.0482 | 0.0623 | 0.0292 | 0.0162 |
| DFAC | 0.5595 | 0.4688 | 0.4352 | 0.4265 | 0.3323 |
| EFFP | 0.5970 | 0.7643 | 0.7743 | 0.6825 | 1.0839 |
| INCIDM | 5.261 | 3.247 | 2.502 | .312 | -4.217 |
| DEVM | 12.924 | 8.460 | 7.844 | 7.439 | 11.241 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 2.002 | 1.610 | 0.250 | -0.292 | -2.459 |
| BETA 7 | 47.510 | 42.020 | 38.799 | 35.864 | 32.460 |
| BETA(PR) 6 | 54.913 | 57.859 | 60.494 | 62.888 | 66.537 |
| BETA(PR) 7 | 23.339 | 39.144 | 46.182 | 49.508 | 53.202 |
| V 6 | 339.61 | 363.18 | 383.89 | 396.49 | 382.87 |
| V 7 | 522.25 | 485.01 | 481.70 | 503.34 | 514.09 |
| VZ 6 | 339.30 | 362.62 | 383.78 | 396.45 | 382.52 |
| VZ 7 | 350.84 | 359.85 | 375.15 | 407.81 | 433.76 |
| V-THETA 6 | 11.87 | 10.21 | 1.67 | -2.02 | -16.50 |
| V-THETA 7 | 385.10 | 324.66 | 301.83 | 294.88 | 275.92 |
| V(PR) 6 | 590.3 | 681.8 | 779.3 | 869.9 | 960.7 |
| V(PR) 7 | 384.2 | 464.6 | 542.2 | 628.2 | 724.2 |
| VTHETA PR6 | -483.0 | -577.1 | -678.2 | -774.3 | -881.3 |
| VTHETA PR7 | -152.2 | -293.3 | -391.2 | -477.7 | -579.9 |
| U 6 | 494.88 | 587.35 | 679.83 | 772.31 | 864.79 |
| U 7 | 537.31 | 617.93 | 693.06 | 772.63 | 855.80 |
| M 6 | 0.3071 | 0.3288 | 0.3480 | 0.3597 | 0.3471 |
| M 7 | 0.4633 | 0.4293 | 0.4253 | 0.4436 | 0.4520 |
| M(PR) 6 | 0.5338 | 0.6173 | 0.7064 | 0.7893 | 0.8709 |
| M(PR) 7 | 0.3408 | 0.4113 | 0.4788 | 0.5537 | 0.6367 |
| TURN(PR) | 31.566 | 18.686 | 14.305 | 13.378 | 13.335 |
| $\bar{\omega}$ | 0.1069 | 0.1096 | 0.1159 | 0.0883 | 0.1036 |
| DFAC | .5814 | .5008 | .4660 | .4303 | .3889 |
| EFFP | 0.9332 | 0.9784 | 0.9590 | 0.9578 | 0.9363 |
| EFF | 0.9312 | 0.9778 | 0.9577 | 0.9564 | 0.9339 |
| INCIDM | 6.313 | 5.359 | 4.394 | 3.288 | 3.337 |
| DEVM | 4.539 | 6.644 | 4.082 | .908 | .302 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

80 PERCENT SPEED PT. 136 — CONFIGURATION: SLTO — $N/\sqrt{\theta}$: 4850. — $\omega\sqrt{\theta}/\delta$: 222.8

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 2.328 | 1.764 | 0.159 | -0.896 | -2.296 |
| V 3 | 350.21 | 371.52 | 385.15 | 391.72 | 392.04 |
| V 4 | 365.36 | 393.91 | 409.02 | 416.36 | 414.65 |
| VZ 3 | 350.17 | 371.07 | 385.12 | 391.70 | 392.02 |
| VZ 4 | 365.05 | 391.35 | 409.01 | 416.30 | 414.32 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 14.84 | 12.12 | 1.13 | -6.51 | -16.61 |
| M 3 | 0.3168 | 0.3365 | 0.3492 | 0.3553 | 0.3556 |
| M 4 | 0.3308 | 0.3573 | 0.3714 | 0.3783 | 0.3767 |
| TURN | -2.33 | -1.76 | -0.16 | 0.90 | 2.30 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.022 | -0.044 | -0.061 | -0.071 | -0.079 |
| EFFP | 0.9986 | 1.0361 | 0.9500 | 0.9910 | 0.8835 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 3.072 | 1.936 | 1.741 | 1.196 | .696 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 34.480 | 30.892 | 28.176 | 25.242 | 22.770 |
| BETA 10 | 1.858 | 0.270 | 0.438 | -0.310 | 1.663 |
| V 9 | 549.06 | 527.32 | 520.48 | 525.21 | 528.43 |
| V 10 | 497.62 | 479.30 | 484.54 | 489.06 | 510.80 |
| VZ 9 | 444.62 | 449.13 | 457.86 | 475.02 | 487.13 |
| VZ 10 | 494.38 | 475.57 | 483.53 | 489.01 | 510.44 |
| V-THETA 9 | 310.83 | 270.73 | 245.76 | 223.97 | 204.52 |
| V-THETA 10 | 16.14 | 2.26 | 3.71 | -2.65 | 14.82 |
| M 9 | 0.4909 | 0.4705 | 0.4635 | 0.4671 | 0.4691 |
| M 10 | 0.4430 | 0.4260 | 0.4303 | 0.4338 | 0.4529 |
| TURN | 32.622 | 30.622 | 27.738 | 25.552 | 21.107 |
| $\bar{\omega}$ | 0.0563 | 0.0402 | 0.0440 | 0.0218 | 0.0270 |
| DFAC | 0.2978 | 0.3001 | 0.2737 | 0.2708 | 0.2082 |
| EFFP | 0.6333 | 0.5468 | 0.5486 | 0.4074 | 0.9698 |
| INCIDM | -6.420 | -6.208 | -6.524 | -8.758 | -13.230 |
| DEVM | 10.558 | 7.770 | 7.938 | 7.690 | 10.563 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 2.053 | 1.536 | 0.159 | -0.928 | -2.467 |
| BETA 7 | 36.342 | 32.595 | 29.468 | 26.700 | 23.619 |
| BETA(PR) 6 | 50.338 | 53.554 | 57.097 | 60.269 | 64.175 |
| BETA(PR) 7 | 26.105 | 38.145 | 45.226 | 50.354 | 53.816 |
| V 6 | 398.80 | 425.82 | 439.14 | 445.26 | 427.84 |
| V 7 | 544.22 | 514.79 | 506.08 | 505.83 | 517.64 |
| VZ 6 | 398.45 | 425.33 | 439.06 | 445.18 | 427.44 |
| VZ 7 | 436.33 | 433.29 | 440.39 | 451.82 | 474.27 |
| V-THETA 6 | 14.29 | 11.41 | 1.22 | -7.21 | -18.42 |
| V-THETA 7 | 322.50 | 277.32 | 248.96 | 227.28 | 207.39 |
| V(PR) 6 | 624.3 | 716.2 | 808.3 | 897.7 | 981.2 |
| V(PR) 7 | 488.2 | 551.5 | 625.6 | 708.2 | 803.4 |
| VTHETA PR6 | -480.6 | -575.9 | -678.6 | -779.5 | -883.2 |
| VTHETA PR7 | -214.8 | -340.6 | -444.1 | -545.3 | -648.4 |
| U 6 | 494.88 | 587.35 | 679.83 | 772.31 | 864.79 |
| U 7 | 537.31 | 617.93 | 693.06 | 772.63 | 855.80 |
| M 6 | 0.3619 | 0.3871 | 0.3996 | 0.4053 | 0.3890 |
| M 7 | 0.4864 | 0.4589 | 0.4502 | 0.4493 | 0.4592 |
| M(PR) 6 | 0.5665 | 0.6510 | 0.7355 | 0.8172 | 0.8921 |
| M(PR) 7 | 0.4363 | 0.4916 | 0.5565 | 0.6291 | 0.7127 |
| TURN(PR) | 24.226 | 15.388 | 11.867 | 9.914 | 10.358 |
| $\bar{\omega}$ | 0.0936 | 0.0630 | 0.0700 | 0.0727 | 0.0950 |
| DFAC | .3996 | .3764 | .3549 | .3276 | .2890 |
| EFFP | 1.0089 | 1.0191 | 1.0109 | 0.9973 | 0.9897 |
| EFF | 1.0091 | 1.0196 | 1.0112 | 0.9972 | 0.9893 |
| INCIDM | 1.738 | 1.054 | .997 | .669 | .975 |
| DEVM | 7.305 | 5.645 | 3.126 | 1.754 | .916 |

Table B-2. Blade Element Data SLTO Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 80 PERCENT SPEED | PT. 132 | SLTO | 4850. | 239.3 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 2.339 | 1.421 | 0.107 | -0.540 | -1.673 |
| V 3 | 379.32 | 402.20 | 416.35 | 423.05 | 422.91 |
| V 4 | 395.48 | 428.63 | 443.22 | 455.45 | 446.84 |
| VZ 3 | 379.26 | 401.70 | 416.31 | 423.01 | 422.88 |
| VZ 4 | 395.14 | 426.22 | 443.19 | 455.41 | 446.65 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 16.14 | 10.63 | 0.82 | -4.29 | -13.04 |
| M 3 | 0.3438 | 0.3650 | 0.3782 | 0.3845 | 0.3844 |
| M 4 | 0.3588 | 0.3897 | 0.4034 | 0.4149 | 0.4068 |
| TURN | -2.34 | -1.42 | -0.11 | 0.54 | 1.67 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.021 | -0.052 | -0.064 | -0.082 | -0.072 |
| EFFP | 0.6021 | 0.8046 | 0.7327 | 0.9542 | 0.6935 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 3.061 | 2.279 | 1.793 | .840 | .073 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 28.411 | 24.869 | 21.986 | 18.746 | 17.734 |
| BETA 10 | 1.567 | 0.456 | -0.007 | -0.926 | 1.432 |
| V 9 | 592.20 | 566.69 | 546.94 | 540.01 | 540.43 |
| V 10 | 592.15 | 564.57 | 547.81 | 542.74 | 549.33 |
| VZ 9 | 510.59 | 510.84 | 506.74 | 511.35 | 514.62 |
| VZ 10 | 588.62 | 560.89 | 547.02 | 542.66 | 548.99 |
| V-THETA 9 | 280.82 | 238.32 | 203.88 | 173.54 | 164.62 |
| V-THETA 10 | 16.19 | 4.49 | -0.06 | -8.77 | 13.72 |
| M 9 | 0.5312 | 0.5090 | 0.4905 | 0.4838 | 0.4836 |
| M 10 | 0.5330 | 0.5070 | 0.4913 | 0.4864 | 0.4920 |
| TURN | 26.844 | 24.414 | 21.893 | 19.672 | 16.303 |
| $\bar{\omega}$ | 0.0476 | 0.0444 | 0.0364 | 0.0262 | 0.0286 |
| DFAC | 0.1672 | 0.1731 | 0.1625 | 0.1530 | 0.1195 |
| EFFP | 14.2267 | -11.7038 | 32.8036 | 10.2299 | 3.0690 |
| INCIDM | -12.489 | -12.231 | -12.814 | -15.254 | -18.266 |
| DEVM | 10.267 | 7.956 | 7.493 | 7.074 | 10.332 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 2.045 | 1.235 | 0.158 | -0.717 | -1.579 |
| BETA 7 | 30.336 | 26.460 | 23.002 | 20.197 | 18.068 |
| BETA(PR) 6 | 47.735 | 51.022 | 54.855 | 58.081 | 62.389 |
| BETA(PR) 7 | 26.235 | 37.342 | 44.853 | 50.528 | 53.776 |
| V 6 | 436.00 | 467.55 | 477.76 | 484.92 | 459.11 |
| V 7 | 577.49 | 547.53 | 530.46 | 520.33 | 532.23 |
| VZ 6 | 435.61 | 467.11 | 477.66 | 484.86 | 458.94 |
| VZ 7 | 496.21 | 489.68 | 488.02 | 488.25 | 505.98 |
| V-THETA 6 | 15.56 | 10.08 | 1.32 | -6.07 | -12.65 |
| V-THETA 7 | 291.67 | 243.96 | 207.28 | 179.65 | 165.07 |
| V(PR) 6 | 647.8 | 742.8 | 829.8 | 917.1 | 990.2 |
| V(PR) 7 | 555.7 | 616.5 | 688.8 | 768.2 | 856.2 |
| VTHETA PR6 | -479.3 | -577.3 | -678.5 | -778.4 | -877.4 |
| VTHETA PR7 | -245.6 | -374.0 | -485.8 | -593.0 | -690.7 |
| U 6 | 494.88 | 587.35 | 679.83 | 772.31 | 864.79 |
| U 7 | 537.31 | 617.93 | 693.06 | 772.63 | 855.80 |
| M 6 | 0.3966 | 0.4264 | 0.4360 | 0.4428 | 0.4184 |
| M 7 | 0.5191 | 0.4909 | 0.4750 | 0.4655 | 0.4760 |
| M(PR) 6 | 0.5893 | 0.6773 | 0.7573 | 0.8374 | 0.9024 |
| M(PR) 7 | 0.4995 | 0.5528 | 0.6168 | 0.6872 | 0.7657 |
| TURN(PR) | 21.493 | 13.660 | 9.997 | 7.552 | 8.613 |
| $\bar{\omega}$ | 0.0680 | 0.0654 | 0.0844 | 0.0957 | 0.0874 |
| DFAC | .2989 | .2942 | .2744 | .2524 | .2192 |
| EFFP | 1.0692 | 1.0605 | 1.0645 | 1.0186 | 1.0501 |
| EFF | 1.0709 | 1.0620 | 1.0660 | 1.0190 | 1.0514 |
| INCIDM | -.865 | -1.478 | -1.245 | -1.519 | -.811 |
| DEVM | 7.435 | 4.842 | 2.753 | 1.928 | .876 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT. 154 | SLTO | 6070. | 197.3 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | C.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.299 | 1.056 | -0.173 | 0.831 | 4.149 |
| V 3 | 303.52 | 320.83 | 334.49 | 343.55 | 346.36 |
| V 4 | 307.81 | 333.39 | 357.90 | 360.06 | 375.85 |
| VZ 3 | 303.51 | 320.28 | 334.48 | 343.54 | 346.35 |
| VZ 4 | 307.71 | 331.05 | 357.89 | 360.01 | 374.87 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 6.98 | 6.14 | -1.08 | 5.22 | 27.19 |
| M 3 | 0.2739 | 0.2898 | 0.3023 | 0.3107 | 0.3133 |
| M 4 | 0.2778 | 0.3013 | 0.3239 | 0.3259 | 0.3406 |
| TURN | -1.30 | -1.06 | 0.17 | -0.83 | -4.15 |
| $\bar{\omega}$ | 0.0170 | | 0.0212 | | 0.0230 |
| DFAC | -0.002 | -0.029 | -0.072 | -0.040 | -0.046 |
| EFFP | 0.4715 | 0.5512 | 1.0339 | 0.8095 | 1.4089 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.101 | 2.644 | 2.073 | -.531 | -5.749 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 50.754 | 54.324 | 53.414 | 40.242 | 47.824 |
| BETA 10 | -4.627 | 2.657 | -1.780 | 0.462 | 5.675 |
| V 9 | 548.84 | 520.90 | 509.46 | 558.01 | 603.55 |
| V 10 | 303.15 | 343.66 | 344.13 | 410.32 | 516.47 |
| VZ 9 | 341.07 | 300.45 | 301.84 | 425.51 | 405.22 |
| VZ 10 | 298.78 | 339.09 | 341.84 | 409.76 | 513.92 |
| V-THETA 9 | 425.05 | 423.14 | 409.08 | 360.49 | 447.29 |
| V-THETA 10 | -24.45 | 15.90 | -10.69 | 3.31 | 51.07 |
| M 9 | 0.4813 | 0.4529 | 0.4403 | 0.4851 | 0.5181 |
| M 10 | 0.2619 | 0.2957 | 0.2943 | 0.3532 | 0.4409 |
| TURN | 55.381 | 51.672 | 55.194 | 39.780 | 42.149 |
| $\bar{\omega}$ | 0.2021 | 0.1963 | 0.2074 | 0.2154 | 0.1396 |
| DFAC | 0.7606 | 0.6611 | 0.6872 | 0.5643 | 0.4641 |
| EFFP | 0.5266 | 0.5650 | 0.3480 | 0.1494 | 0.1538 |
| INCIDM | 9.854 | 17.224 | 18.714 | 6.242 | 11.824 |
| DEVM | 4.073 | 10.152 | 5.720 | 8.462 | 14.575 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 1.139 | 0.919 | -0.173 | 0.778 | 3.628 |
| BETA 7 | 51.401 | 55.500 | 55.039 | 41.857 | 49.803 |
| BETA(PR) 6 | 61.223 | 64.514 | 66.442 | 67.791 | 69.381 |
| BETA(PR) 7 | 34.155 | 49.149 | 57.092 | 56.627 | 58.913 |
| V 6 | 336.67 | 348.23 | 371.59 | 392.54 | 398.54 |
| V 7 | 558.15 | 522.85 | 508.73 | 537.81 | 583.91 |
| VZ 6 | 336.50 | 347.74 | 371.47 | 392.46 | 397.73 |
| VZ 7 | 346.08 | 295.73 | 291.30 | 400.43 | 376.84 |
| V-THETA 6 | 6.69 | 5.58 | -1.12 | 5.33 | 25.22 |
| V-THETA 7 | 436.22 | 430.90 | 416.93 | 358.87 | 446.01 |
| V(PR) 6 | 699.0 | 808.4 | 929.5 | 1038.3 | 1129.5 |
| V(PR) 7 | 420.8 | 452.8 | 536.6 | 728.2 | 729.9 |
| VTHETA PR6 | -612.7 | -729.5 | -852.0 | -961.3 | -1057.1 |
| VTHETA PR7 | -236.2 | -342.5 | -450.5 | -608.1 | -625.1 |
| U 6 | 619.36 | 735.10 | 850.84 | 966.58 | 1082.32 |
| U 7 | 672.46 | 773.37 | 867.40 | 966.98 | 1071.07 |
| M 6 | 0.3044 | 0.3150 | 0.3366 | 0.3560 | 0.3616 |
| M 7 | 0.4899 | 0.4547 | 0.4397 | 0.4671 | 0.5011 |
| M(PR) 6 | 0.6319 | 0.7312 | 0.8420 | 0.9418 | 1.0248 |
| M(PR) 7 | 0.3694 | 0.3937 | 0.4637 | 0.6324 | 0.6263 |
| TURN(PR) | 27.060 | 15.337 | 9.343 | 11.162 | 10.468 |
| $\bar{\omega}$ | 0.1133 | 0.2525 | 0.3817 | 0.2334 | 0.1919 |
| DFAC | .6337 | .6472 | .6121 | .4510 | .5287 |
| EFFP | 1.0471 | 0.9430 | 0.8794 | 1.0484 | 0.8776 |
| EFF | 1.0493 | 0.9403 | 0.8735 | 1.0511 | 0.8702 |
| INCIDM | 12.623 | 12.014 | 10.342 | 8.191 | 6.181 |
| DEVM | 15.355 | 16.649 | 14.992 | 6.027 | 6.013 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT. 155 | SLTO | 6050. | 209.3 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.102 | C.790 | -0.337 | 0.385 | 2.705 |
| V 3 | 325.10 | 343.43 | 357.21 | 365.91 | 369.13 |
| V 4 | 327.74 | 354.44 | 382.24 | 387.53 | 399.19 |
| VZ 3 | 325.09 | 342.82 | 357.20 | 365.90 | 369.11 |
| VZ 4 | 327.65 | 352.14 | 382.20 | 387.51 | 398.74 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 6.30 | 4.89 | -2.25 | 2.60 | 18.84 |
| M 3 | 0.2937 | 0.3106 | 0.3233 | 0.3313 | 0.3343 |
| M 4 | 0.2961 | C.3207 | 0.3465 | 0.3514 | 0.3622 |
| TURN | -1.10 | -0.79 | 0.34 | -0.38 | -2.71 |
| $\bar{\omega}$ | 0.0197 | | 0.0180 | | 0.0230 |
| DFAC | 0.002 | -0.025 | -0.073 | -0.056 | -0.056 |
| EFFP | 0.4678 | 0.5287 | 1.0283 | 0.8168 | 1.2199 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.298 | 2.910 | 2.237 | -.065 | -4.305 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 49.046 | 51.462 | 48.954 | 43.678 | 42.438 |
| BETA 10 | 1.418 | 2.507 | -0.126 | 1.369 | 4.294 |
| V 9 | 555.31 | 527.50 | 517.03 | 578.76 | 617.49 |
| V 10 | 286.81 | 364.52 | 373.12 | 437.04 | 561.29 |
| VZ 9 | 357.55 | 325.40 | 337.81 | 418.11 | 455.72 |
| VZ 10 | 283.14 | 360.00 | 371.02 | 436.31 | 559.71 |
| V-THETA 9 | 419.39 | 412.60 | 389.93 | 399.70 | 416.68 |
| V-THETA 10 | 7.10 | 15.94 | -0.82 | 10.43 | 42.03 |
| M 9 | 0.4876 | 0.4595 | 0.4483 | 0.5010 | 0.5331 |
| M 10 | 0.2477 | 0.3145 | 0.3206 | 0.3747 | 0.4825 |
| TURN | 47.628 | 48.955 | 49.080 | 42.311 | 38.143 |
| $\bar{\omega}$ | 0.1871 | 0.1782 | 0.1910 | 0.1926 | 0.0873 |
| DFAC | 0.7663 | 0.6176 | 0.6109 | 0.5597 | 0.3865 |
| EFFP | 0.3985 | 0.5239 | 0.3843 | 0.2062 | 0.2589 |
| INCIDM | 8.146 | 14.362 | 14.254 | 9.678 | 6.438 |
| DEVM | 10.118 | 10.007 | 7.374 | 9.368 | 13.194 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.963 | 0.654 | -0.368 | 0.374 | 2.417 |
| BETA 7 | 49.419 | 52.691 | 50.312 | 45.499 | 44.693 |
| BETA(PR) 6 | 59.629 | 62.925 | 64.875 | 66.520 | 68.110 |
| BETA(PR) 7 | 33.004 | 47.562 | 54.928 | 55.123 | 56.972 |
| V 6 | 358.39 | 372.84 | 399.05 | 417.36 | 426.59 |
| V 7 | 567.04 | 528.59 | 514.88 | 560.72 | 594.13 |
| VZ 6 | 358.22 | 372.34 | 398.91 | 417.31 | 426.20 |
| VZ 7 | 366.37 | 319.90 | 328.54 | 392.89 | 422.33 |
| V-THETA 6 | 6.03 | 4.26 | -2.56 | 2.72 | 17.99 |
| V-THETA 7 | 430.66 | 420.43 | 396.21 | 399.93 | 417.85 |
| V(PR) 6 | 708.6 | 818.3 | 939.5 | 1047.4 | 1143.2 |
| V(PR) 7 | 439.8 | 474.8 | 572.2 | 687.3 | 774.9 |
| VTHETA PR6 | -611.3 | -728.4 | -850.6 | -960.7 | -1060.8 |
| VTHETA PR7 | -239.6 | -350.4 | -468.3 | -563.9 | -649.7 |
| U 6 | 617.32 | 732.68 | 848.04 | 963.40 | 1078.76 |
| U 7 | 670.25 | 770.82 | 864.54 | 963.79 | 1067.54 |
| M 6 | 0.3244 | 0.3378 | 0.3621 | 0.3792 | 0.3878 |
| M 7 | 0.4985 | 0.4605 | 0.4465 | 0.4849 | 0.5121 |
| M(PR) 6 | 0.6414 | 0.7413 | 0.8526 | 0.9516 | 1.0393 |
| M(PR) 7 | 0.3867 | 0.4136 | 0.4962 | 0.5944 | 0.6679 |
| TURN(PR) | 26.617 | 15.335 | 9.940 | 11.395 | 11.138 |
| $\bar{\omega}$ | 0.1160 | 0.3883 | 0.2283 | 0.2338 | 0.1660 |
| DFAC | .5989 | .6203 | .5695 | .5132 | .4860 |
| EFFP | 1.0506 | 0.9567 | 0.9143 | 0.9419 | 0.9372 |
| EFF | 1.0530 | 0.9547 | 0.9102 | 0.9386 | 0.9281 |
| INCIDM | 11.029 | 10.425 | 8.775 | 6.920 | 4.910 |
| DEVM | 14.204 | 15.062 | 12.826 | 6.523 | 4.072 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT. 156 | SLTO | 6001. | 224.1 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.048 | 0.501 | -0.605 | 0.294 | -0.213 |
| V 3 | 349.14 | 369.96 | 385.92 | 395.81 | 399.53 |
| V 4 | 356.48 | 385.29 | 413.08 | 422.15 | 432.23 |
| VZ 3 | 349.13 | 369.36 | 385.91 | 395.80 | 399.51 |
| VZ 4 | 356.40 | 382.35 | 413.05 | 422.14 | 432.23 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 6.52 | 3.37 | -4.36 | 2.17 | -1.61 |
| M 3 | 0.3158 | 0.3351 | 0.3499 | 0.3591 | 0.3626 |
| M 4 | 0.3226 | 0.3493 | 0.3752 | 0.3837 | 0.3931 |
| TURN | -1.05 | -0.50 | 0.61 | -0.29 | 0.21 |
| $\bar{\omega}$ | 0.0193 | | 0.0240 | | 0.0230 |
| DFAC | -0.011 | -0.037 | -0.076 | -0.064 | -0.084 |
| EFFP | 0.4718 | 0.5426 | 0.8869 | 0.7875 | 1.0581 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.352 | -3.199 | 2.505 | .006 | -1.387 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.736 | 48.245 | 43.316 | 40.152 | 37.192 |
| BETA 10 | 4.393 | 2.244 | -0.049 | 1.052 | 3.468 |
| V 9 | 557.15 | 534.24 | 526.85 | 585.43 | 623.02 |
| V 10 | 317.14 | 384.76 | 404.83 | 479.37 | 585.24 |
| VZ 9 | 367.23 | 351.74 | 381.26 | 446.91 | 496.30 |
| VZ 10 | 312.53 | 379.51 | 402.36 | 478.56 | 584.17 |
| V-THETA 9 | 412.32 | 398.54 | 361.43 | 377.49 | 376.61 |
| V-THETA 10 | 24.29 | 15.06 | -0.34 | 8.80 | 35.40 |
| M 9 | 0.4898 | 0.4665 | 0.4589 | 0.5090 | 0.5400 |
| M 10 | 0.2745 | 0.3327 | 0.3498 | 0.4136 | 0.5058 |
| TURN | 43.343 | 46.001 | 43.365 | 39.100 | 33.724 |
| $\bar{\omega}$ | 0.1878 | 0.1472 | 0.1519 | 0.1317 | 0.0328 |
| DFAC | 0.6955 | 0.5744 | 0.5338 | 0.4760 | 0.3274 |
| EFFP | 0.4282 | 0.5543 | 0.4809 | 0.4177 | 0.7716 |
| INCIDM | 6.836 | 11.145 | 8.616 | 6.152 | 1.192 |
| DEVM | 13.093 | 9.744 | 7.451 | 9.052 | 12.368 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 0.919 | 0.426 | -0.575 | 0.272 | -0.357 |
| BETA 7 | 48.175 | 49.584 | 44.975 | 42.022 | 39.532 |
| BETA(PR) 6 | 57.544 | 60.815 | 62.782 | 64.483 | 66.633 |
| BETA(PR) 7 | 32.331 | 45.891 | 53.036 | 53.987 | 56.006 |
| V 6 | 385.66 | 404.79 | 435.03 | 455.16 | 463.58 |
| V 7 | 569.55 | 534.61 | 520.73 | 565.19 | 594.80 |
| VZ 6 | 385.50 | 404.24 | 434.89 | 455.11 | 463.56 |
| VZ 7 | 377.34 | 346.13 | 368.10 | 419.75 | 458.74 |
| V-THETA 6 | 6.18 | 3.01 | -4.37 | 2.16 | -2.89 |
| V-THETA 7 | 424.43 | 407.03 | 368.05 | 378.35 | 378.59 |
| V(PR) 6 | 718.4 | 829.2 | 950.9 | 1056.5 | 1168.8 |
| V(PR) 7 | 449.5 | 498.0 | 612.6 | 714.1 | 820.5 |
| VTHETA PR6 | -606.1 | -723.7 | -845.5 | -953.4 | -1072.9 |
| VTHETA PR7 | -240.4 | -357.5 | -489.5 | -577.6 | -680.3 |
| U 6 | 612.32 | 726.75 | 841.17 | 955.60 | 1070.02 |
| U 7 | 664.82 | 764.58 | 857.54 | 955.99 | 1058.89 |
| M 6 | 0.3497 | 0.3675 | 0.3957 | 0.4147 | 0.4226 |
| M 7 | 0.5013 | 0.4669 | 0.4535 | 0.4908 | 0.5145 |
| M(PR) 6 | 0.6513 | 0.7528 | 0.8650 | 0.9625 | 1.0655 |
| M(PR) 7 | 0.3956 | 0.4349 | 0.5335 | 0.6202 | 0.7097 |
| TURN(PR) | 25.205 | 14.892 | 9.739 | 10.494 | 10.626 |
| $\bar{\omega}$ | 0.1137 | 0.1900 | 0.2190 | 0.0758 | 0.1428 |
| DFAC | .5877 | .6340 | .5207 | .4829 | .4511 |
| EFFP | 1.0366 | 0.9643 | 0.9561 | 0.9722 | 0.9487 |
| EFF | 1.0383 | 0.9627 | 0.9541 | 0.9707 | 0.9456 |
| INCIDM | 8.944 | 8.315 | 6.682 | 4.883 | 3.433 |
| DEVM | 13.531 | 13.391 | 10.936 | 5.387 | 3.106 |

# Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT. 157 | SLTO | 6054. | 242. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.188 | 0.490 | -0.609 | -0.921 | -0.488 |
| V 3 | 381.69 | 405.62 | 423.21 | 433.41 | 436.76 |
| V 4 | 396.36 | 425.30 | 453.33 | 461.36 | 471.04 |
| VZ 3 | 381.67 | 405.05 | 423.19 | 433.39 | 436.74 |
| VZ 4 | 396.27 | 421.86 | 453.30 | 461.30 | 471.03 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 8.21 | 3.64 | -4.82 | -7.41 | -4.01 |
| M 3 | 0.3460 | 0.3682 | 0.3847 | 0.3942 | 0.3974 |
| M 4 | 0.3596 | 0.3866 | 0.4129 | 0.4205 | 0.4297 |
| TURN | -1.19 | -0.49 | 0.61 | 0.92 | 0.49 |
| $\bar{\omega}$ | 0.0192 | | 0.0260 | | 0.0210 |
| DFAC | -0.027 | -0.044 | -0.077 | -0.073 | -0.083 |
| EFFP | 0.6579 | 0.6285 | 0.8808 | 0.7477 | 0.9787 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.212 | 3.210 | 2.509 | 1.221 | -1.112 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.087 | 41.316 | 37.667 | 35.140 | 34.506 |
| BETA 10 | 5.270 | 0.875 | -0.655 | -0.833 | 2.523 |
| V 9 | 579.62 | 551.74 | 556.10 | 597.16 | 621.44 |
| V 10 | 374.96 | 428.86 | 464.51 | 520.64 | 588.25 |
| VZ 9 | 386.14 | 409.73 | 438.16 | 487.93 | 512.10 |
| VZ 10 | 369.65 | 423.45 | 462.11 | 520.07 | 587.67 |
| V-THETA 9 | 424.50 | 364.26 | 339.82 | 343.71 | 352.04 |
| V-THETA 10 | 34.44 | 6.55 | -5.31 | -7.57 | 25.89 |
| M 9 | 0.5097 | 0.4843 | 0.4867 | 0.5213 | 0.5400 |
| M 10 | 0.3249 | 0.3730 | 0.4038 | 0.4519 | 0.5099 |
| TURN | 41.816 | 40.441 | 38.322 | 35.973 | 31.983 |
| $\bar{\omega}$ | 0.2160 | 0.0657 | 0.0825 | 0.0384 | 0.0216 |
| DFAC | 0.6086 | 0.4889 | 0.4378 | 0.4035 | 0.3090 |
| EFFP | 0.4506 | 0.5545 | 0.6400 | 0.6313 | 1.1017 |
| INCIDM | 6.187 | 4.216 | 2.967 | 1.140 | -1.494 |
| DEVM | 13.970 | 8.375 | 6.845 | 7.167 | 11.423 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 5 | 1.049 | 0.408 | -0.562 | -0.835 | -0.622 |
| BETA 7 | 47.943 | 42.865 | 39.346 | 36.772 | 36.422 |
| BETA(PR) 6 | 55.136 | 58.203 | 60.420 | 62.768 | 65.181 |
| BETA(PR) 7 | 30.261 | 44.712 | 51.064 | 53.399 | 56.007 |
| V 6 | 425.12 | 453.09 | 484.51 | 499.98 | 501.76 |
| V 7 | 591.80 | 548.64 | 543.70 | 575.03 | 597.78 |
| VZ 6 | 424.94 | 452.54 | 484.38 | 499.89 | 501.73 |
| VZ 7 | 394.06 | 401.65 | 420.19 | 460.49 | 481.00 |
| V-THETA 6 | 7.78 | 3.22 | -4.75 | -7.29 | -5.45 |
| V-THETA 7 | 439.40 | 373.23 | 344.70 | 344.23 | 354.92 |
| V(PR) 6 | 743.4 | 859.1 | 981.3 | 1092.4 | 1195.3 |
| V(PR) 7 | 459.0 | 565.9 | 669.0 | 772.5 | 860.4 |
| VTHETA PR6 | -609.9 | -729.9 | -853.3 | -971.3 | -1084.9 |
| VTHETA PR7 | -231.3 | -398.1 | -520.4 | -620.2 | -713.3 |
| U 6 | 617.73 | 733.16 | 848.60 | 964.04 | 1079.47 |
| U 7 | 670.69 | 771.33 | 865.11 | 964.43 | 1068.25 |
| M 6 | 0.3864 | 0.4127 | 0.4424 | 0.4571 | 0.4588 |
| M 7 | 0.5210 | 0.4815 | 0.4756 | 0.5014 | 0.5186 |
| M(PR) 6 | 0.6758 | 0.7826 | 0.8960 | 0.9988 | 1.0930 |
| M(PR) 7 | 0.4041 | 0.4966 | 0.5852 | 0.6736 | 0.7464 |
| TURN(PR) | 24.868 | 13.460 | 9.351 | 9.367 | 9.174 |
| $\bar{\omega}$ | 0.0867 | 0.1150 | 0.1061 | 0.0878 | 0.1435 |
| DFAC | .5958 | .5109 | .4681 | .4365 | .4217 |
| EFFP | 0.9814 | 1.0298 | 1.0041 | 1.0063 | 0.9487 |
| EFF | 0.9806 | 1.0312 | 1.0043 | 1.0067 | 0.9458 |
| INCIDM | 6.536 | 5.703 | 4.326 | 3.168 | 1.981 |
| DEVM | 11.461 | 12.212 | 8.964 | 4.799 | 3.107 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT. 158 | SLTO | 6040. | 260.5 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.223 | C.450 | -0.974 | -1.433 | -0.695 |
| V 3 | 416.80 | 443.11 | 461.87 | 471.37 | 473.54 |
| V 4 | 438.04 | 468.15 | 497.46 | 503.22 | 510.20 |
| VZ 3 | 416.77 | 442.52 | 461.84 | 471.35 | 473.51 |
| VZ 4 | 437.93 | 464.69 | 497.38 | 503.05 | 510.17 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 9.35 | 3.68 | -8.46 | -12.58 | -6.19 |
| M 3 | 0.3787 | 0.4033 | 0.4210 | 0.4300 | 0.4320 |
| M 4 | 0.3986 | 0.4269 | 0.4547 | 0.4602 | 0.4669 |
| TURN | -1.22 | -0.45 | 0.97 | 1.43 | 0.70 |
| $\bar{\omega}$ | 0.0184 | | 0.0214 | | 0.0240 |
| DFAC | -0.039 | -0.052 | -0.086 | -0.081 | -0.084 |
| EFFP | 0.7110 | 0.6677 | 0.9482 | 0.7759 | 0.9205 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.177 | 3.250 | 2,874 | 1.733 | -.905 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 40.135 | 35.480 | 31.351 | 29.924 | 30.403 |
| BETA 10 | 2.901 | 0.051 | 0.050 | -1.261 | 1.350 |
| V 9 | 609.69 | 588.24 | 600.14 | 609.60 | 615.01 |
| V 10 | 489.01 | 507.26 | 529.51 | 555.16 | 604.83 |
| VZ 9 | 456.62 | 474.31 | 510.87 | 528.16 | 530.40 |
| VZ 10 | 484.78 | 502.02 | 527.69 | 554.80 | 604.59 |
| V-THETA 9 | 393.00 | 341.43 | 312.24 | 304.09 | 311.24 |
| V-THETA 10 | 24.75 | 0.45 | 0.46 | -12.21 | 14.25 |
| M 9 | 0.5396 | 0.5194 | 0.5291 | 0.5356 | 0.5372 |
| M 10 | 0.4284 | 0.4449 | 0.4640 | 0.4856 | 0.5280 |
| TURN | 37.233 | 35.430 | 31.301 | 31.184 | 29.053 |
| $\bar{\omega}$ | 0.1448 | 0.0344 | 0.0445 | 0.0088 | 0.0143 |
| DFAC | 0.4275 | 0.3757 | 0.3463 | 0.3322 | 0.2517 |
| EFFP | 0.4870 | 0.5575 | 0.4318 | 0.5210 | 3.5717 |
| INCIDM | -0.765 | -1.620 | -3.349 | -4.076 | -5.597 |
| DEVM | 11.601 | 7.551 | 7.550 | 6.739 | 10.250 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 1.076 | 0.351 | -0.921 | -1.325 | -0.895 |
| BETA 7 | 41.572 | 37.274 | 32.874 | 31.352 | 31.885 |
| BETA(PR) 6 | 52.082 | 55.319 | 57.849 | 60.819 | 63.730 |
| BETA(PR) 7 | 29.711 | 42.337 | 48.098 | 52.751 | 55.838 |
| V 6 | 473.35 | 504.50 | 537.75 | 544.32 | 535.76 |
| V 7 | 613.63 | 578.33 | 583.67 | 585.51 | 598.95 |
| VZ 6 | 473.16 | 504.00 | 537.58 | 544.14 | 535.70 |
| VZ 7 | 456.69 | 459.70 | 489.92 | 499.91 | 508.56 |
| V-THETA 6 | 8.89 | 3.09 | -8.64 | -12.59 | -8.35 |
| V-THETA 7 | 407.18 | 350.25 | 316.81 | 304.63 | 316.37 |
| V(PR) 6 | 770.0 | 886.0 | 1010.3 | 1116.1 | 1210.3 |
| V(PR) 7 | 528.6 | 622.6 | 734.0 | 826.1 | 905.7 |
| VTHETA PR6 | -607.4 | -728.4 | -855.3 | -974.4 | -1085.3 |
| VTHETA PR7 | -262.0 | -419.3 | -546.3 | -657.6 | -749.4 |
| U 6 | 616.30 | 731.47 | 846.64 | 961.81 | 1076.98 |
| U 7 | 669.14 | 769.55 | 863.11 | 962.20 | 1065.77 |
| M 6 | 0.4318 | 0.4614 | 0.4933 | 0.4996 | 0.4914 |
| M 7 | 0.5433 | 0.5102 | 0.5139 | 0.5136 | 0.5227 |
| M(PR) 6 | 0.7025 | 0.8104 | 0.9267 | 1.0243 | 1.1100 |
| M(PR) 7 | 0.4680 | 0.5492 | 0.6463 | 0.7246 | 0.7903 |
| TURN(PR) | 22.365 | 12.956 | 9.746 | 8.067 | 7.893 |
| $\bar{\omega}$ | 0.1137 | 0.0815 | 0.0940 | 0.0965 | 0.1673 |
| DFAC | .5035 | .4516 | .4089 | .3867 | .3776 |
| EFFP | 0.9932 | 1.0262 | 1.0328 | 1.0017 | 0.9292 |
| EFF | 0.9929 | 1.0273 | 1.0343 | 1.0018 | 0.9257 |
| INCIDM | 3.482 | 2.819 | 1.749 | 1.219 | .530 |
| DEVM | 10.911 | 9.837 | 5.998 | 4.151 | 2.938 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT.153 | SLTO | 6020. | 280.5 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 1.606 | 0.907 | -0.383 | -1.653 | -3.249 |
| V 3 | 463.70 | 491.39 | 507.59 | 514.29 | 514.09 |
| V 4 | 483.04 | 523.00 | 544.97 | 557.14 | 545.55 |
| VZ 3 | 463.62 | 490.80 | 507.54 | 514.25 | 514.05 |
| VZ 4 | 482.83 | 520.49 | 544.90 | 556.89 | 544.68 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 13.54 | 8.28 | -3.64 | -16.07 | -30.92 |
| M 3 | 0.4227 | 0.4489 | 0.4644 | 0.4708 | 0.4706 |
| M 4 | 0.4410 | 0.4791 | 0.5002 | 0.5120 | 0.5008 |
| TURN | -1.61 | -0.91 | 0.38 | 1.65 | 3.25 |
| $\bar{\omega}$ | 0.0281 | | 0.0216 | | 0.0220 |
| DFAC | -0.027 | -0.056 | -0.077 | -0.099 | -0.091 |
| EFFP | 0.8119 | 0.9487 | 0.9143 | 1.0087 | 0.7728 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 3.794 | 2.793 | 1.517 | 1.953 | 1.649 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 29.165 | 24.917 | 23.710 | 20.645 | 18.538 |
| BETA 10 | 1.843 | C.592 | 0.193 | -1.398 | 0.652 |
| V 9 | 715.34 | 692.76 | 648.96 | 614.17 | 616.27 |
| V 10 | 725.69 | 690.43 | 654.82 | 614.44 | 652.85 |
| VZ 9 | 614.96 | 624.98 | 593.57 | 574.71 | 584.18 |
| VZ 10 | 721.41 | 686.70 | 654.12 | 614.25 | 652.64 |
| V-THETA 9 | 348.60 | 291.86 | 260.95 | 216.54 | 195.93 |
| V-THETA 10 | 23.34 | 7.13 | 2.21 | -15.00 | 7.43 |
| M 9 | 0.6437 | 0.6223 | 0.5796 | 0.5466 | 0.5465 |
| M 10 | 0.6538 | C.6201 | 0.5852 | 0.5468 | 0.5813 |
| TURN | 27.321 | 24.325 | 23.517 | 22.043 | 17.885 |
| $\bar{\omega}$ | 0.1357 | 0.1339 | 0.1386 | 0.1160 | 0.0905 |
| DFAC | 0.1583 | 0.1721 | 0.1664 | 0.1760 | 0.0896 |
| EFFP | 4.2002 | -14.7944 | 6.7688 | 117.9792 | 1.1808 |
| INCIDM | -11.735 | -12.183 | -10.990 | -13.355 | -17.462 |
| DEVM | 10.543 | 8.092 | 7.693 | 6.602 | 9.552 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 1.382 | 0.717 | -0.240 | -1.658 | -3.297 |
| BETA 7 | 31.426 | 26.761 | 24.522 | 22.199 | 19.349 |
| BETA(PR) 6 | 48.081 | 51.129 | 54.996 | 58.867 | 63.078 |
| BETA(PR) 7 | 27.224 | 38.376 | 45.873 | 53.654 | 56.251 |
| V 6 | 540.09 | 582.15 | 592.80 | 589.62 | 562.45 |
| V 7 | 694.44 | 662.72 | 635.81 | 586.14 | 609.27 |
| VZ 6 | 539.81 | 581.78 | 592.69 | 589.34 | 561.52 |
| VZ 7 | 589.99 | 591.17 | 578.17 | 542.62 | 574.86 |
| V-THETA 6 | 13.03 | 7.29 | -2.49 | -17.06 | -32.35 |
| V-THETA 7 | 362.07 | 298.40 | 263.88 | 221.46 | 201.86 |
| V(PR) 6 | 808.1 | 927.2 | 1033.3 | 1139.9 | 1240.2 |
| V(PR) 7 | 666.4 | 754.8 | 830.8 | 915.7 | 1034.8 |
| VTHETA PR6 | -601.2 | -721.8 | -846.3 | -975.7 | -1105.8 |
| VTHETA PR7 | -304.8 | -468.6 | -596.4 | -737.6 | -860.4 |
| U 6 | 614.26 | 729.05 | 843.83 | 958.62 | 1073.41 |
| U 7 | 666.92 | 767.00 | 860.25 | 959.02 | 1062.25 |
| M 6 | 0.4955 | 0.5362 | 0.5466 | 0.5435 | 0.5171 |
| M 7 | 0.6234 | 0.5934 | 0.5672 | 0.5203 | 0.5402 |
| M(PR) 6 | 0.7414 | 0.8541 | 0.9528 | 1.0508 | 1.1402 |
| M(PR) 7 | 0.5982 | 0.6759 | 0.7411 | 0.8129 | 0.9174 |
| TURN(PR) | 20.851 | 12.738 | 9.118 | 5.211 | 6.826 |
| $\bar{\omega}$ | 0.0423 | 0.0550 | 0.1296 | 0.1682 | 0.2093 |
| DFAC | .3341 | .3096 | .3044 | .2901 | .2543 |
| EFFP | 1.0467 | 1.0583 | 0.9908 | 0.8358 | 0.8728 |
| EFF | 1.0485 | 1.0604 | 0.9905 | 0.8309 | 0.8685 |
| INCIDM | -.519 | -1.371 | -1.104 | -.733 | -.122 |
| DEVM | 8.424 | 5.876 | 3.773 | 5.054 | 3.351 |

# Table B-2. Blade Element Data SLTO Configuration (Continued)

110 PERCENT SPEED Pt. 161 — CONFIGURATION SLTO — $N/\sqrt{\theta}$ 6659.0 — $\omega\sqrt{\theta}/\delta$ 223.62

## INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 4.859 | 5.395 | 5.124 | 7.590 | 7.757 |
| V 3 | 356.13 | 375.33 | 386.90 | 392.72 | 393.36 |
| V 4 | 352.51 | 388.39 | 416.07 | 426.56 | 429.34 |
| VZ 3 | 356.13 | 374.61 | 386.89 | 392.71 | 393.35 |
| VZ 4 | 351.16 | 384.99 | 414.26 | 422.77 | 425.41 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 29.86 | 36.52 | 37.16 | 56.34 | 57.95 |
| M 3 | 0.3223 | 0.3401 | 0.3508 | 0.3562 | 0.3568 |
| M 4 | 0.3190 | 0.3522 | 0.3780 | 0.3878 | 0.3904 |
| TURN | -4.86 | -5.39 | -5.12 | -7.59 | -7.76 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.053 | 0.015 | -0.027 | -0.014 | -0.018 |
| EFFP | -0.8387 | 0.6735 | 0.9356 | 0.8945 | 0.8693 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 0.541 | -1.695 | -3.224 | -7.290 | -9.357 |

## STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 49.936 | 51.295 | 53.127 | 49.652 | 51.367 |
| BETA 10 | -7.170 | 3.191 | -1.317 | 1.257 | 4.493 |
| V 9 | 641.29 | 607.34 | 606.90 | 665.42 | 691.10 |
| V 10 | 319.48 | 380.16 | 388.56 | 454.35 | 574.98 |
| VZ 9 | 406.78 | 377.53 | 363.30 | 430.67 | 431.46 |
| VZ 10 | 312.59 | 376.76 | 387.30 | 453.99 | 573.19 |
| V-THETA 9 | 490.80 | 473.96 | 485.50 | 507.13 | 539.86 |
| V-THETA 10 | -39.88 | 21.16 | -8.93 | 9.97 | 45.04 |
| M 9 | 0.5618 | 0.5280 | 0.5231 | 0.5725 | 0.5880 |
| M 10 | 0.2736 | 0.3256 | 0.3303 | 0.3849 | 0.4848 |
| TURN | 57.106 | 48.105 | 54.444 | 48.395 | 46.874 |
| $\bar{\omega}$ | .0927 | .1791 | .1849 | .1980 | .1217 |
| DFAC | 0.8184 | 0.6800 | 0.7183 | 0.6669 | 0.5167 |
| EFFP | 0.5514 | 0.6942 | 0.6367 | 0.4551 | 0.7280 |
| INCIDM | 9.036 | 14.195 | 18.427 | 15.652 | 15.367 |
| DEVM | 1.530 | 10.691 | 6.183 | 9.257 | 13.393 |

## ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 4.220 | 4.946 | 4.899 | 7.218 | 6.929 |
| BETA 7 | 50.533 | 52.310 | 54.280 | 51.122 | 53.819 |
| BETA(PR) 6 | 58.983 | 61.672 | 64.144 | 65.804 | 68.397 |
| BETA(PR) 7 | 29.404 | 44.611 | 52.656 | 53.765 | 57.965 |
| V 6 | 392.10 | 416.96 | 435.75 | 454.13 | 451.70 |
| V 7 | 652.23 | 607.96 | 602.93 | 648.34 | 670.68 |
| VZ 6 | 390.88 | 415.02 | 433.98 | 450.47 | 448.39 |
| VZ 7 | 411.50 | 371.12 | 351.73 | 406.83 | 395.91 |
| V-THETA 6 | 28.86 | 35.95 | 37.21 | 57.06 | 54.49 |
| V-THETA 7 | 503.52 | 481.10 | 489.51 | 504.72 | 541.35 |
| V(PR) 6 | 758.6 | 874.8 | 995.2 | 1099.1 | 1217.5 |
| V(PR) 7 | 475.9 | 522.1 | 580.3 | 688.4 | 745.4 |
| VTHETA PR6 | -650.1 | -769.9 | -895.5 | -1002.5 | -1132.0 |
| VTHETA PR7 | -233.6 | -366.7 | -461.3 | -555.3 | -632.8 |
| U 6 | 678.95 | 805.83 | 932.70 | 1059.58 | 1185.45 |
| U 7 | 737.16 | 847.78 | 950.85 | 1060.01 | 1174.12 |
| M 6 | 0.3556 | 0.3788 | 0.3964 | 0.4137 | 0.4114 |
| M 7 | 0.5721 | 0.5287 | 0.5198 | 0.5573 | 0.5702 |
| M(PR) 6 | 0.6881 | 0.7946 | 0.9053 | 1.0012 | 1.1089 |
| M(PR) 7 | 0.4174 | 0.4540 | 0.5003 | 0.5918 | 0.6345 |
| TURN(PR) | 29.569 | 17.039 | 11.479 | 12.036 | 10.425 |
| $\bar{\omega}$ | .0688 | .2295 | .3851 | .1804 | .2947 |
| DFAC | .6032 | .6042 | .6084 | .5555 | .5744 |
| EFFP | 1.0152 | 0.9529 | 0.8733 | 0.9036 | 0.8258 |
| EFF | 1.0161 | 0.9503 | 0.8661 | 0.8973 | 0.8145 |
| INCIDM | 10.383 | 9.172 | 8.044 | 6.204 | 5.190 |
| DEVM | 10.604 | 12.111 | 10.556 | 5.165 | 5.066 |

# Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 110 PERCENT SPEED Pt. 165 | SLTO | 6652.0 | 279.67 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | -2.242 | -2.257 | -2.184 | -2.178 | -2.200 |
| V 3 | 458.93 | 487.02 | 505.22 | 513.52 | 514.52 |
| V 4 | 478.23 | 515.44 | 541.58 | 551.39 | 555.22 |
| VZ 3 | 458.89 | 486.40 | 505.19 | 513.50 | 514.49 |
| VZ 4 | 477.66 | 511.99 | 541.15 | 550.97 | 554.81 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | -18.71 | -20.30 | -20.64 | -20.95 | -21.32 |
| M 3 | 0.4182 | 0.4448 | 0.4621 | 0.4700 | 0.4710 |
| M 4 | 0.4365 | 0.4719 | 0.4970 | 0.5064 | 0.5101 |
| TURN | 2.24 | 2.26 | 2.18 | 2.18 | 2.20 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | -0.063 | -0.079 | -0.093 | -0.094 | -0.100 |
| EFFP | 0.8291 | 0.8575 | 0.9492 | 0.8812 | 0.9548 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 7.642 | 5.957 | 4.084 | 2.478 | 0.600 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 36.812 | 31.659 | 29.765 | 29.652 | 30.561 |
| BETA 10 | 3.548 | 1.019 | 1.250 | 0.013 | 1.709 |
| V 9 | 647.02 | 626.44 | 644.41 | 629.81 | 625.76 |
| V 10 | 542.74 | 565.29 | 539.17 | 588.32 | 616.52 |
| VZ 9 | 508.38 | 523.01 | 556.31 | 547.30 | 538.76 |
| VZ 10 | 537.85 | 560.65 | 587.81 | 588.27 | 616.21 |
| V-THETA 9 | 387.69 | 330.66 | 319.92 | 311.58 | 318.17 |
| V-THETA 10 | 33.58 | 10.05 | 12.56 | 0.13 | 18.39 |
| M 9 | 0.5712 | 0.5521 | 0.5633 | 0.5503 | 0.5430 |
| M 10 | 0.4746 | 0.4954 | 0.5152 | 0.5123 | 0.5349 |
| TURN | 33.264 | 30.641 | 28.515 | 29.639 | 28.851 |
| $\bar{\omega}$ | .1707 | .1775 | .1741 | .2111 | .2516 |
| DFAC | 0.3689 | 0.3077 | 0.2953 | 0.2974 | 0.2479 |
| EFFP | 0.0923 | 0.2039 | 0.2175 | 0.3608 | 2.2459 |
| INCIDM | -4.088 | -5.241 | -4.935 | -4.348 | -5.439 |
| DEVM | 12.248 | 8.519 | 8.750 | 8.013 | 10.609 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.335 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | -1.980 | -2.043 | -1.989 | -2.014 | -2.124 |
| BETA 7 | 38.556 | 33.649 | 31.279 | 31.057 | 30.980 |
| BETA(PR) 6 | 53.081 | 55.682 | 58.181 | 61.176 | 64.498 |
| BETA(PR) 7 | 33.458 | 45.062 | 49.689 | 55.242 | 58.418 |
| V 6 | 524.01 | 564.42 | 591.78 | 594.83 | 576.37 |
| V 7 | 646.41 | 610.45 | 622.68 | 605.41 | 614.76 |
| VZ 6 | 523.57 | 563.64 | 591.30 | 594.42 | 575.97 |
| VZ 7 | 502.81 | 507.63 | 531.86 | 518.52 | 527.05 |
| V-THETA 6 | -18.10 | -20.12 | -20.54 | -20.90 | -21.36 |
| V-THETA 7 | 402.90 | 338.25 | 323.30 | 312.33 | 316.44 |
| V(PR) 6 | 871.7 | 1000.0 | 1121.6 | 1232.9 | 1337.8 |
| V(PR) 7 | 605.9 | 719.4 | 822.6 | 909.7 | 1006.4 |
| VTHETA PR6 | -696.8 | -825.7 | -953.0 | -1080.2 | -1207.5 |
| VTHETA PR7 | -334.0 | -509.3 | -627.3 | -747.4 | -857.3 |
| U 6 | 678.75 | 805.58 | 932.42 | 1059.26 | 1186.10 |
| U 7 | 736.94 | 847.52 | 950.56 | 1059.70 | 1173.76 |
| M 6 | 0.4801 | 0.5190 | 0.5456 | 0.5486 | 0.5306 |
| M 7 | 0.5706 | 0.5372 | 0.5464 | 0.5281 | 0.5332 |
| M(PR) 6 | 0.7986 | 0.9195 | 1.0341 | 1.1372 | 1.2316 |
| M(PR) 7 | 0.5349 | 0.6331 | 0.7218 | 0.7935 | 0.8729 |
| TURN(PR) | 19.617 | 10.600 | 8.487 | 5.932 | 6.081 |
| $\bar{\omega}$ | .1881 | .1832 | .1844 | .2216 | .2663 |
| DFAC | .4814 | .4213 | .3954 | .3828 | .3663 |
| EFFP | 1.0155 | 1.0348 | 1.0203 | 0.9339 | 0.8659 |
| EFF | 1.0162 | 1.0365 | 1.0213 | 0.9305 | 0.8588 |
| INCIDM | 4.481 | 3.182 | 2.081 | 1.576 | 1.298 |
| DEVM | 14.658 | 12.562 | 7.589 | 6.642 | 5.518 |

## Table B-2. Blade Element Data SLTO Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 110 PERCENT SPEED Pt. 160 | SLTO | 668.2 | 290.69 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 5.389 | 5.176 | 3.996 | 2.936 | -0.545 |
| V 3 | 487.00 | 515.20 | 531.18 | 538.40 | 540.37 |
| V 4 | 509.28 | 550.00 | 575.38 | 585.40 | 571.17 |
| VZ 3 | 486.93 | 514.60 | 531.13 | 538.37 | 540.34 |
| VZ 4 | 507.01 | 545.44 | 573.93 | 584.63 | 571.15 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 47.83 | 49.62 | 40.10 | 29.99 | -5.44 |
| M 3 | 0.4448 | 0.4716 | 0.4870 | 0.4939 | 0.4958 |
| M 4 | 0.4660 | 0.5051 | 0.5297 | 0.5394 | 0.5256 |
| TURN | -5.39 | -5.18 | -4.00 | -2.94 | 0.55 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.005 | -0.019 | -0.045 | -0.059 | -0.062 |
| EFFP | 0.9248 | 0.9473 | 0.9110 | 0.9379 | 0.7668 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 0.011 | -1.476 | -2.096 | -2.636 | -1.055 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 29.664 | 26.707 | 26.493 | 24.771 | 20.295 |
| BETA 10 | 2.442 | 1.380 | -0.454 | -0.289 | 2.701 |
| V 9 | 778.60 | 749.17 | 649.39 | 643.21 | 692.95 |
| V 10 | 773.27 | 728.65 | 656.86 | 624.58 | 708.72 |
| VZ 9 | 666.71 | 666.22 | 580.56 | 583.90 | 649.90 |
| VZ 10 | 768.36 | 724.89 | 656.02 | 624.50 | 707.85 |
| V-THETA 9 | 385.34 | 336.70 | 289.69 | 269.50 | 240.35 |
| V-THETA 10 | 32.94 | 17.55 | -5.20 | -3.15 | 33.40 |
| M 9 | 0.7026 | 0.6741 | 0.5785 | 0.5713 | 0.6152 |
| M 10 | 0.6973 | 0.6540 | 0.5856 | 0.5536 | 0.6305 |
| TURN | 27.223 | 25.327 | 26.947 | 25.060 | 17.593 |
| $\bar{\omega}$ | 0.0654 | 0.0571 | 0.0292 | 0.0229 | 0.0259 |
| DFAC | 0.1787 | 0.2022 | 0.1884 | 0.2274 | 0.1228 |
| EFFP | -6.5320 | -0.9675 | 3.9187 | -2.0430 | 2.6309 |
| INCIDM | -11.236 | -10.393 | -8.207 | -9.229 | -15.705 |
| DEVM | 11.142 | 8.880 | 7.046 | 7.711 | 11.601 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 4.599 | 4.485 | 3.591 | 2.721 | -0.572 |
| BETA 7 | 31.993 | 28.758 | 26.777 | 26.797 | 21.093 |
| BETA(PR) 6 | 47.929 | 51.095 | 55.488 | 59.425 | 63.364 |
| BETA(PR) 7 | 28.177 | 38.935 | 48.528 | 55.812 | 56.179 |
| V 6 | 575.74 | 616.37 | 618.69 | 612.71 | 600.60 |
| V 7 | 752.21 | 715.79 | 653.73 | 603.15 | 572.79 |
| VZ 6 | 573.76 | 614.17 | 617.37 | 611.49 | 590.57 |
| VZ 7 | 635.26 | 626.91 | 583.35 | 538.32 | 527.71 |
| V-THETA 6 | 46.16 | 48.20 | 38.76 | 29.06 | -5.99 |
| V-THETA 7 | 399.53 | 344.38 | 294.52 | 271.91 | 242.12 |
| V(PR) 6 | 856.4 | 978.1 | 1089.7 | 1202.1 | 1339.6 |
| V(PR) 7 | 723.7 | 806.7 | 881.3 | 958.1 | 1127.8 |
| VTHETA PR6 | -635.6 | -761.0 | -897.9 | -1035.0 | -1197.4 |
| VTHETA PR7 | -341.7 | -507.0 | -660.3 | -792.6 | -935.9 |
| U 6 | 681.81 | 809.22 | 936.63 | 1064.04 | 1191.45 |
| U 7 | 740.26 | 851.35 | 954.85 | 1064.48 | 1179.05 |
| M 6 | 0.5300 | 0.5698 | 0.5720 | 0.5657 | 0.5543 |
| M 7 | 0.6765 | 0.6415 | 0.5827 | 0.5339 | 0.5964 |
| M(PR) 6 | 0.7884 | 0.9042 | 1.0075 | 1.1107 | 1.2363 |
| M(PR) 7 | 0.6509 | 0.7230 | 0.7855 | 0.8480 | 0.9997 |
| TURN(PR) | 19.746 | 12.145 | 6.955 | 3.611 | 7.195 |
| $\bar{\omega}$ | 0.0535 | 0.0625 | 0.2086 | 0.1977 | 0.2423 |
| DFAC | .4466 | .4851 | .5168 | .5480 | .5554 |
| EFFP | 1.0577 | 1.0545 | 0.9508 | 0.7637 | 0.9334 |
| EFF | 1.0602 | 1.0568 | 0.9490 | 0.7565 | 0.8996 |
| INCIDM | -0.671 | -1.405 | -0.612 | -0.175 | 0.164 |
| DEVM | 9.377 | 6.435 | 6.428 | 7.212 | 3.279 |

Table B-3. Blade Element Data Cruise Configuration

| 50PERCENT SPEED PT.182 | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 3078. | 85.5 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.821 | 27.804 | 26.025 | 23.444 | 20.421 |
| V 3 | 130.94 | 137.07 | 140.43 | 142.15 | 142.04 |
| V 4 | 153.75 | 158.86 | 162.70 | 165.09 | 160.03 |
| VZ 3 | 130.94 | 136.88 | 140.43 | 142.14 | 142.04 |
| VZ 4 | 132.02 | 139.92 | 146.15 | 151.43 | 149.97 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 78.78 | 74.10 | 71.39 | 65.68 | 55.84 |
| M 3 | 0.1175 | 0.1230 | 0.1260 | 0.1275 | 0.1274 |
| M 4 | 0.1380 | 0.1426 | 0.1460 | 0.1482 | 0.1436 |
| TURN | -30.82 | -27.80 | -26.03 | -23.44 | -20.42 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.134 | 0.115 | 0.097 | 0.071 | 0.070 |
| EFFP | 0.9635 | 0.9575 | 0.9458 | 1.0498 | 0.8521 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.179 | 6.496 | 6.475 | 7.456 | 8.579 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 57.942 | 55.735 | 56.814 | 53.012 | 47.628 |
| BETA 10 | 30.949 | 26.816 | 25.991 | 25.801 | 25.328 |
| V 9 | 306.98 | 302.18 | 302.80 | 315.56 | 322.35 |
| V 10 | 126.13 | 204.73 | 209.41 | 238.75 | 257.81 |
| VZ 9 | 160.15 | 169.21 | 165.45 | 189.83 | 217.19 |
| VZ 10 | 106.30 | 181.40 | 187.79 | 214.90 | 232.97 |
| V-THETA 9 | 260.17 | 249.73 | 253.41 | 252.06 | 238.15 |
| V-THETA 10 | 64.86 | 92.36 | 91.77 | 103.91 | 110.29 |
| M 9 | 0.2741 | 0.2696 | 0.2696 | 0.2807 | 0.2865 |
| M 10 | 0.1119 | 0.1820 | 0.1859 | 0.2117 | 0.2285 |
| TURN | 26.993 | 28.919 | 30.823 | 27.212 | 22.301 |
| $\bar{\omega}$ | 0.4963 | 0.2149 | 0.2296 | 0.2039 | 0.2438 |
| DFAC | 0.8264 | 0.5335 | 0.5413 | 0.4618 | 0.3900 |
| EFFP | 0.4558 | 0.6940 | 0.6494 | 0.5562 | 0.3993 |
| INCIDM | 8.042 | 9.635 | 13.114 | 10.012 | 2.628 |
| DEVM | 13.649 | 8.316 | 7.491 | 7.801 | 8.228 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.835 | 25.845 | 24.619 | 22.061 | 19.589 |
| BETA 7 | 57.841 | 57.070 | 58.237 | 54.701 | 48.751 |
| BETA(PR) 6 | 58.688 | 63.422 | 66.920 | 69.283 | 72.479 |
| BETA(PR) 7 | 23.778 | 40.090 | 49.339 | 52.785 | 55.116 |
| V 6 | 163.56 | 166.90 | 169.24 | 173.45 | 165.34 |
| V 7 | 315.42 | 302.38 | 300.63 | 310.93 | 319.94 |
| VZ 6 | 144.59 | 150.08 | 153.81 | 160.73 | 155.77 |
| VZ 7 | 166.46 | 164.18 | 158.15 | 179.62 | 210.94 |
| V-THETA 6 | 76.37 | 72.76 | 70.50 | 65.15 | 55.43 |
| V-THETA 7 | 267.03 | 253.80 | 255.60 | 253.77 | 240.55 |
| V(PR) 6 | 278.2 | 335.5 | 392.4 | 454.4 | 517.4 |
| V(PR) 7 | 183.5 | 214.9 | 242.9 | 297.1 | 368.8 |
| VTHETA PR6 | -237.7 | -300.0 | -360.9 | -425.0 | -493.4 |
| VTHETA PR7 | -74.0 | -138.4 | -184.2 | -236.6 | -302.6 |
| U 6 | 314.07 | 372.76 | 431.45 | 490.14 | 548.83 |
| U 7 | 341.00 | 392.16 | 439.84 | 490.34 | 543.12 |
| M 6 | 0.1468 | 0.1498 | 0.1519 | 0.1557 | 0.1484 |
| M 7 | 0.2818 | 0.2697 | 0.2677 | 0.2766 | 0.2843 |
| M(PR) 6 | 0.2498 | 0.3012 | 0.3523 | 0.4080 | 0.4645 |
| M(PR) 7 | 0.1639 | 0.1917 | 0.2163 | 0.2642 | 0.3278 |
| TURN(PR) | 34.902 | 23.314 | 17.574 | 16.496 | 17.363 |
| $\bar{\omega}$ | 0.1155 | 0.1767 | 0.2237 | 0.1828 | 0.2952 |
| DFAC | .4896 | .5302 | .5672 | .5740 | .5710 |
| EFFP | 0.9570 | 0.9738 | 0.9182 | 0.9192 | 0.9442 |
| EFF | 0.9566 | 0.9735 | 0.9172 | 0.9181 | 0.9434 |
| INCIDM | 10.088 | 10.922 | 10.820 | 9.683 | 9.279 |
| DEVM | 4.978 | 7.590 | 7.239 | 4.185 | 2.216 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50PERCENT SPEED PT.183 | CRUISE | 3057. | 91.0 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.294 | 27.761 | 25.934 | 23.344 | 19.766 |
| V 3 | 136.98 | 144.39 | 148.98 | 151.96 | 153.04 |
| V 4 | 161.62 | 169.92 | 174.55 | 175.29 | 169.75 |
| VZ 3 | 136.98 | 144.19 | 148.97 | 151.95 | 153.04 |
| VZ 4 | 139.55 | 149.53 | 156.96 | 160.94 | 159.75 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 81.53 | 79.15 | 76.34 | 69.46 | 57.40 |
| M 3 | 0.1229 | 0.1296 | 0.1337 | 0.1364 | 0.1373 |
| M 4 | 0.1451 | 0.1526 | 0.1567 | 0.1574 | 0.1524 |
| TURN | -30.29 | -27.76 | -25.93 | -23.34 | -19.77 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.125 | 0.101 | 0.086 | 0.076 | 0.078 |
| EFFP | 0.8113 | 0.9138 | 0.9518 | 1.0192 | 0.8198 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.706 | 6.539 | 6.566 | 7.556 | 9.234 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 55.417 | 53.779 | 56.684 | 51.936 | 44.303 |
| BETA 10 | 30.112 | 27.115 | 26.771 | 26.090 | 25.488 |
| V 9 | 310.97 | 300.43 | 301.69 | 311.94 | 320.18 |
| V 10 | 164.18 | 209.83 | 214.29 | 249.14 | 267.63 |
| VZ 9 | 173.44 | 176.23 | 165.10 | 192.13 | 229.13 |
| VZ 10 | 140.32 | 185.07 | 190.53 | 223.50 | 241.58 |
| V-THETA 9 | 256.02 | 242.37 | 252.11 | 245.60 | 223.63 |
| V-THETA 10 | 82.37 | 95.64 | 96.52 | 109.57 | 115.17 |
| M 9 | 0.2778 | 0.2682 | 0.2688 | 0.2777 | 0.2850 |
| M 10 | 0.1459 | 0.1867 | 0.1903 | 0.2212 | 0.2377 |
| TURN | 25.304 | 26.664 | 29.914 | 25.847 | 18.815 |
| $\bar{\omega}$ | 0.3494 | 0.1601 | 0.2183 | 0.1709 | 0.2132 |
| DFAC | 0.6789 | 0.4992 | 0.5145 | 0.4042 | 0.3264 |
| EFFP | 0.5491 | 0.7276 | 0.6442 | 0.5136 | 0.2465 |
| INCIDM | 5.517 | 7.679 | 12.984 | 8.936 | -0.697 |
| DEVM | 12.812 | 8.615 | 8.271 | 8.090 | 8.388 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.538 | 25.927 | 24.771 | 22.128 | 18.562 |
| BETA 7 | 56.129 | 55.046 | 57.528 | 53.850 | 46.384 |
| BETA(PR) 6 | 57.021 | 61.408 | 65.257 | 67.925 | 70.811 |
| BETA(PR) 7 | 23.084 | 39.692 | 48.937 | 52.878 | 55.645 |
| V 6 | 170.59 | 177.51 | 179.39 | 182.96 | 179.18 |
| V 7 | 317.16 | 300.73 | 299.22 | 306.90 | 311.24 |
| VZ 6 | 151.22 | 159.48 | 162.84 | 169.47 | 169.85 |
| VZ 7 | 175.64 | 172.10 | 160.56 | 181.01 | 214.70 |
| V-THETA 6 | 78.87 | 77.61 | 75.16 | 68.92 | 57.04 |
| V-THETA 7 | 263.34 | 246.49 | 252.44 | 247.81 | 225.33 |
| V(PR) 6 | 277.8 | 333.3 | 389.1 | 450.9 | 516.8 |
| V(PR) 7 | 192.1 | 223.9 | 244.6 | 300.0 | 380.5 |
| VTHETA PR6 | -233.1 | -292.6 | -353.3 | -417.9 | -488.0 |
| VTHETA PR7 | -75.3 | -143.0 | -184.4 | -239.2 | -314.1 |
| U 6 | 311.92 | 370.22 | 428.50 | 486.79 | 545.09 |
| U 7 | 338.67 | 389.49 | 436.84 | 487.00 | 539.42 |
| M 6 | 0.1532 | 0.1594 | 0.1611 | 0.1643 | 0.1609 |
| M 7 | 0.2834 | 0.2685 | 0.2666 | 0.2732 | 0.2769 |
| M(PR) 6 | 0.2495 | 0.2993 | 0.3494 | 0.4050 | 0.4641 |
| M(PR) 7 | 0.1717 | 0.1999 | 0.2179 | 0.2670 | 0.3385 |
| TURN(PR) | 33.930 | 21.691 | 16.314 | 15.046 | 15.166 |
| $\bar{\omega}$ | 0.0739 | 0.1160 | 0.1554 | 0.1191 | 0.1890 |
| DFAC | .4662 | .5053 | .5561 | .5634 | .5566 |
| EFFP | 0.9778 | 0.9974 | 0.9310 | 0.9431 | 1.0108 |
| EFF | 0.9776 | 0.9974 | 0.9302 | 0.9423 | 1.0110 |
| INCIDM | 8.421 | 8.908 | 9.157 | 8.325 | 7.611 |
| DEVM | 4.284 | 7.192 | 6.837 | 4.278 | 2.745 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| 50PERCENT SPEED PT.184 | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}\ \delta$ |
|---|---|---|---|
| | CRUISE | 3070. | 99.5 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 31.103 | 27.866 | 25.986 | 23.297 | 20.042 |
| V 3 | 150.24 | 158.42 | 163.51 | 166.56 | 167.18 |
| V 4 | 182.69 | 187.70 | 191.33 | 191.96 | 185.43 |
| VZ 3 | 150.23 | 158.25 | 163.50 | 166.55 | 167.17 |
| VZ 4 | 156.42 | 164.96 | 171.98 | 176.30 | 174.20 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 94.37 | 87.73 | 83.83 | 75.92 | 63.55 |
| M 3 | 0.1348 | 0.1422 | 0.1468 | 0.1495 | 0.1501 |
| M 4 | 0.1641 | 0.1686 | 0.1719 | 0.1725 | 0.1666 |
| TURN | -31.10 | -27.87 | -25.99 | -23.30 | -20.04 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.106 | 0.096 | 0.088 | 0.076 | 0.081 |
| EFFP | 0.9519 | 0.9388 | 0.9562 | 1.0331 | 0.8428 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.897 | 6.434 | 6.514 | 7.603 | 8.958 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 52.076 | 50.185 | 52.887 | 47.584 | 42.618 |
| BETA 10 | 28.701 | 27.234 | 26.871 | 26.096 | 25.802 |
| V 9 | 324.66 | 312.41 | 310.52 | 318.29 | 320.11 |
| V 10 | 223.65 | 230.12 | 232.57 | 265.21 | 279.23 |
| VZ 9 | 195.98 | 198.59 | 186.81 | 214.58 | 235.56 |
| VZ 10 | 194.57 | 202.85 | 206.77 | 238.02 | 251.38 |
| V-THETA 9 | 256.10 | 239.97 | 247.63 | 234.98 | 216.75 |
| V-THETA 10 | 107.41 | 105.31 | 105.12 | 116.66 | 121.54 |
| M 9 | 0.2904 | 0.2792 | 0.2770 | 0.2838 | 0.2853 |
| M 10 | 0.1992 | 0.2050 | 0.2068 | 0.2359 | 0.2484 |
| TURN | 23.375 | 22.951 | 26.017 | 21.487 | 16.815 |
| $\bar{\omega}$ | 0.1736 | 0.1472 | 0.1810 | 0.1293 | 0.1423 |
| DFAC | 0.4788 | 0.4374 | 0.4508 | 0.3398 | 0.2704 |
| EFFP | 0.7140 | 0.7266 | 0.6186 | 0.5860 | 0.4492 |
| INCIDM | 2.176 | 4.085 | 9.187 | 4.584 | -2.382 |
| DEVM | 11.401 | 8.734 | 8.371 | 8.096 | 8.702 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 28.321 | 25.924 | 24.637 | 21.976 | 19.119 |
| BETA 7 | 53.397 | 51.466 | 54.188 | 49.450 | 44.136 |
| BETA(PR) 6 | 52.616 | 58.285 | 62.648 | 65.741 | 69.347 |
| BETA(PR) 7 | 21.230 | 37.198 | 46.248 | 50.999 | 55.242 |
| V 6 | 192.63 | 196.58 | 197.96 | 201.02 | 193.14 |
| V 7 | 328.79 | 311.65 | 308.48 | 312.97 | 313.02 |
| VZ 6 | 169.54 | 176.65 | 179.91 | 186.41 | 182.49 |
| VZ 7 | 195.02 | 193.99 | 180.43 | 203.44 | 224.65 |
| V-THETA 6 | 91.38 | 85.94 | 82.53 | 75.23 | 63.26 |
| V-THETA 7 | 263.95 | 243.79 | 250.16 | 237.81 | 217.98 |
| V(PR) 6 | 279.2 | 336.1 | 391.6 | 453.7 | 517.4 |
| V(PR) 7 | 210.3 | 243.7 | 261.0 | 323.3 | 394.[illegible] |
| VTHETA PR6 | -221.9 | -285.9 | -347.8 | -413.6 | -484.1 |
| VTHETA PR7 | -76.2 | -147.4 | -188.5 | -251.3 | -323.7 |
| U 6 | 313.25 | 371.79 | 430.33 | 488.86 | 547.4[illegible] |
| U 7 | 340.11 | 391.15 | 438.70 | 489.07 | 541.71 |
| M 6 | 0.1731 | 0.1766 | 0.1779 | 0.1807 | 0.1735 |
| M 7 | 0.2942 | 0.2785 | 0.2751 | 0.2790 | 0.2789 |
| M(PR) 6 | 0.2509 | 0.3020 | 0.3519 | 0.4077 | 0.4648 |
| M(PR) 7 | 0.1882 | 0.2178 | 0.2328 | 0.2882 | 0.351[illegible] |
| TURN(PR) | 31.380 | 21.065 | 16.397 | 14.741 | 14.105 |
| $\bar{\omega}$ | 0.0361 | 0.0847 | 0.1063 | 0.0780 | 0.1059 |
| DFAC | .4829 | .4645 | .5153 | .4474 | .3783 |
| EFFP | 0.9613 | 1.0014 | 0.9163 | 0.9701 | 1.0059 |
| EFF | 0.9610 | 1.0015 | 0.9154 | 0.9697 | 1.006[illegible] |
| INCIDM | 4.016 | +5.785 | 6.548 | 6.141 | 6.147 |
| DEVM | 2.430 | 4.698 | 4.148 | 2.399 | 2.342 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| 50PERCENT SPEED PT.185 | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 3062. | 106.2 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.713 | 27.731 | 25.678 | 23.433 | 19.829 |
| V 3 | 160.31 | 169.17 | 174.77 | 178.06 | 178.96 |
| V 4 | 194.81 | 202.34 | 204.18 | 204.69 | 197.58 |
| VZ 3 | 160.30 | 169.00 | 174.76 | 178.05 | 178.95 |
| VZ 4 | 167.48 | 178.05 | 184.01 | 187.81 | 185.86 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 99.50 | 94.15 | 88.47 | 81.40 | 67.02 |
| M 3 | 0.1439 | 0.1519 | 0.1569 | 0.1599 | 0.1607 |
| M 4 | 0.1750 | 0.1818 | 0.1835 | 0.1840 | 0.1775 |
| TURN | -30.71 | -27.73 | -25.68 | -23.43 | -19.83 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.103 | 0.086 | 0.086 | 0.080 | 0.083 |
| EFFP | 0.8489 | 0.9378 | 0.9098 | 0.9789 | 0.7922 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.287 | 6.569 | 6.822 | 7.467 | 9.171 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.982 | 48.115 | 49.104 | 45.006 | 40.523 |
| BETA 10 | 27.511 | 27.300 | 27.240 | 26.255 | 26.028 |
| V 9 | 332.03 | 318.88 | 312.09 | 317.04 | 315.61 |
| V 10 | 255.82 | 254.57 | 251.94 | 277.19 | 292.81 |
| VZ 9 | 218.47 | 211.34 | 203.73 | 224.04 | 239.91 |
| VZ 10 | 225.33 | 224.32 | 223.28 | 248.44 | 263.11 |
| V-THETA 9 | 246.68 | 237.40 | 235.91 | 224.21 | 205.07 |
| V-THETA 10 | 118.17 | 116.76 | 115.32 | 122.62 | 128.49 |
| M 9 | 0.2974 | 0.2852 | 0.2787 | 0.2830 | 0.2815 |
| M 10 | 0.2283 | 0.2270 | 0.2244 | 0.2470 | 0.2609 |
| TURN | 20.471 | 20.815 | 21.864 | 18.751 | 14.495 |
| $\bar{\omega}$ | 0.1431 | 0.1410 | 0.1727 | 0.1203 | 0.1068 |
| DFAC | 0.3699 | 0.3538 | 0.3606 | 0.2748 | 0.1890 |
| EFFP | 0.7028 | 0.6642 | 0.5218 | 0.4702 | 0.2947 |
| INCIDM | -1.918 | 2.015 | 5.404 | 2.006 | -4.477 |
| DEVM | 10.211 | 8.800 | 8.740 | 8.255 | 8.928 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.817 | 25.760 | 24.332 | 22.182 | 18.692 |
| BETA 7 | 49.454 | 49.474 | 50.438 | 46.655 | 42.413 |
| BETA(PR) 6 | 49.863 | 55.647 | 60.604 | 64.055 | 67.877 |
| BETA(PR) 7 | 21.446 | 35.844 | 45.294 | 50.697 | 55.665 |
| V 6 | 206.18 | 211.76 | 211.52 | 213.79 | 205.98 |
| V 7 | 334.13 | 317.30 | 309.35 | 311.54 | 307.80 |
| VZ 6 | 182.31 | 190.56 | 192.71 | 197.96 | 195.11 |
| VZ 7 | 216.17 | 206.02 | 196.96 | 213.82 | 227.25 |
| V-THETA 6 | 96.21 | 92.03 | 87.15 | 80.72 | 66.01 |
| V-THETA 7 | 253.90 | 241.18 | 238.49 | 226.56 | 207.69 |
| V(PR) 6 | 282.8 | 337.8 | 392.6 | 452.5 | 518.1 |
| V(PR) 7 | 233.4 | 254.3 | 280.1 | 337.6 | 402.9 |
| VTHETA PR6 | -216.2 | -278.8 | -342.1 | -406.9 | -480.0 |
| VTHETA PR7 | -85.3 | -148.9 | -199.1 | -261.2 | -332.7 |
| U 6 | 312.44 | 370.82 | 429.21 | 487.59 | 545.98 |
| U 7 | 339.22 | 390.13 | 437.56 | 487.79 | 540.30 |
| M 6 | 0.1853 | 0.1904 | 0.1902 | 0.1922 | 0.1851 |
| M 7 | 0.2993 | 0.2838 | 0.2763 | 0.2781 | 0.2745 |
| M(PR) 6 | 0.2542 | 0.3037 | 0.3530 | 0.4068 | 0.4657 |
| M(PR) 7 | 0.2090 | 0.2275 | 0.2501 | 0.3013 | 0.3593 |
| TURN(PR) | 28.411 | 19.781 | 15.306 | 13.357 | 12.213 |
| $\bar{\omega}$ | 0.0143 | 0.0321 | 0.0629 | 0.0462 | 0.0745 |
| DFAC | .3915 | .4259 | .4505 | .3978 | .3500 |
| EFFP | 0.9813 | 0.9821 | 0.9334 | 0.9823 | 0.9956 |
| EFF | 0.9812 | 0.9820 | 0.9327 | 0.9821 | 0.9956 |
| INCIDM | 1.263 | 3.147 | 4.504 | 4.455 | 4.677 |
| DEVM | 2.646 | 3.344 | 3.194 | 2.097 | 2.765 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| 50PERCENT SPEED PT.186 | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 3056. | 114.7 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.554 | 27.842 | 26.059 | 23.698 | 22.190 |
| V 3 | 178.12 | 187.18 | 192.02 | 193.01 | 185.99 |
| V 4 | 209.38 | 213.44 | 213.86 | 216.12 | 227.54 |
| VZ 3 | 178.11 | 186.84 | 192.01 | 193.00 | 185.98 |
| VZ 4 | 180.28 | 187.90 | 191.81 | 197.40 | 210.42 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 106.44 | 99.68 | 93.95 | 86.86 | 85.94 |
| M 3 | 0.1600 | 0.1681 | 0.1725 | 0.1734 | 0.1671 |
| M 4 | 0.1882 | 0.1919 | 0.1923 | 0.1943 | 0.2047 |
| TURN | -30.55 | -27.84 | -26.06 | -23.70 | -22.19 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.131 | 0.130 | 0.132 | 0.106 | 0.007 |
| EFFP | 0.9193 | 0.8754 | 0.8556 | 1.0065 | 0.9144 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.446 | 6.458 | 6.441 | 7.202 | 6.810 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 42.946 | 42.802 | 42.312 | 40.123 | 41.385 |
| BETA 10 | 27.160 | 27.257 | 27.608 | 27.113 | 26.266 |
| V 9 | 339.21 | 324.50 | 320.22 | 319.43 | 314.22 |
| V 10 | 288.79 | 287.23 | 281.83 | 297.75 | 308.66 |
| VZ 9 | 244.23 | 236.57 | 236.49 | 244.17 | 231.36 |
| VZ 10 | 255.05 | 253.63 | 249.37 | 265.03 | 276.37 |
| V-THETA 9 | 231.10 | 220.49 | 215.56 | 205.85 | 207.73 |
| V-THETA 10 | 131.82 | 131.55 | 130.61 | 135.70 | 136.59 |
| M 9 | 0.3043 | 0.2908 | 0.2866 | 0.2858 | 0.2808 |
| M 10 | 0.2584 | 0.2569 | 0.2518 | 0.2661 | 0.2757 |
| TURN | 15.786 | 15.545 | 14.704 | 13.009 | 15.119 |
| $\bar{\omega}$ | 0.1832 | 0.1193 | 0.1713 | 0.1020 | 0.1208 |
| DFAC | 0.2527 | 0.2238 | 0.2344 | 0.1701 | 0.1268 |
| EFFP | 0.4222 | 0.5146 | 0.3179 | 0.2278 | -1.3793 |
| INCIDM | -6.954 | -3.298 | -1.388 | -2.877 | -3.615 |
| DEVM | 9.860 | 8.757 | 9.108 | 9.112 | 9.166 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.652 | 25.675 | 24.405 | 22.428 | 21.945 |
| BETA 7 | 44.651 | 44.424 | 43.792 | 41.488 | 43.172 |
| BETA(PR) 6 | 46.790 | 53.470 | 58.733 | 62.361 | 64.718 |
| BETA(PR) 7 | 22.668 | 35.948 | 44.008 | 50.165 | 55.965 |
| V 6 | 221.70 | 224.48 | 224.11 | 226.77 | 233.11 |
| V 7 | 338.59 | 319.71 | 314.32 | 311.99 | 305.69 |
| VZ 6 | 196.27 | 202.11 | 203.89 | 209.52 | 216.22 |
| VZ 7 | 239.44 | 227.93 | 226.61 | 233.57 | 222.81 |
| V-THETA 6 | 102.89 | 97.26 | 92.60 | 86.52 | 87.12 |
| V-THETA 7 | 237.96 | 223.79 | 217.53 | 206.68 | 209.14 |
| V(PR) 6 | 286.7 | 339.7 | 392.9 | 451.7 | 506.3 |
| V(PR) 7 | 261.0 | 282.0 | 315.5 | 364.8 | 398.3 |
| VTHETA PR6 | -208.9 | -272.8 | -335.8 | -400.1 | -457.8 |
| VTHETA PR7 | -100.6 | -165.6 | -219.2 | -280.2 | -330.1 |
| U 6 | 311.82 | 370.09 | 428.36 | 486.64 | 544.91 |
| U 7 | 338.56 | 389.36 | 436.70 | 486.84 | 539.24 |
| M 6 | 0.1994 | 0.2019 | 0.2016 | 0.2040 | 0.2097 |
| M 7 | 0.3037 | 0.2864 | 0.2813 | 0.2790 | 0.2730 |
| M(PR) 6 | 0.2579 | 0.3055 | 0.3534 | 0.4063 | 0.4555 |
| M(PR) 7 | 0.2342 | 0.2527 | 0.2823 | 0.3263 | 0.3558 |
| TURN(PR) | 24.106 | 17.495 | 14.700 | 12.185 | 8.754 |
| $\bar{\omega}$ | 0.0398 | 0.0556 | 0.0452 | 0.0322 | 0.0650 |
| DFAC | .2728 | .3217 | .3326 | .3111 | .3256 |
| EFFP | 1.0160 | 1.0083 | 0.9967 | 1.0137 | 1.0156 |
| EFF | 1.0161 | 1.0084 | 0.9967 | 1.0138 | 1.0158 |
| INCIDM | -1.810 | 0.970 | 2.633 | 2.761 | 1.518 |
| DEVM | 3.868 | 3.448 | 1.908 | 1.565 | 3.065 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50PERCENT SPEED PT.181 | CRUISE | 3080. | 121.0 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.882 | 27.581 | 25.717 | 23.274 | 19.867 |
| V 3 | 184.56 | 194.21 | 200.22 | 203.28 | 203.72 |
| V 4 | 227.31 | 230.30 | 233.27 | 233.70 | 225.37 |
| VZ 3 | 184.54 | 194.03 | 200.21 | 203.27 | 203.71 |
| VZ 4 | 195.08 | 203.06 | 210.16 | 214.68 | 211.96 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 116.67 | 106.63 | 101.22 | 92.34 | 76.59 |
| M 3 | 0.1658 | 0.1745 | 0.1799 | 0.1827 | 0.1831 |
| M 4 | 0.2045 | 0.2072 | 0.2099 | 0.2103 | 0.2027 |
| TURN | -30.88 | -27.58 | -25.72 | -23.27 | -19.87 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.092 | 0.092 | 0.089 | 0.078 | 0.081 |
| EFFP | 0.9056 | 0.8651 | 0.8825 | 0.9607 | 0.7777 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.118 | 6.719 | 6.783 | 7.626 | 9.133 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 41.352 | 40.131 | 39.949 | 37.712 | 35.045 |
| BETA 10 | 27.858 | 27.618 | 27.788 | 26.995 | 27.104 |
| V 9 | 353.36 | 332.97 | 324.07 | 322.93 | 312.80 |
| V 10 | 318.75 | 313.64 | 303.24 | 315.74 | 319.75 |
| VZ 9 | 260.94 | 253.03 | 248.00 | 255.44 | 256.06 |
| VZ 10 | 280.19 | 276.05 | 267.78 | 281.30 | 284.58 |
| V-THETA 9 | 233.46 | 214.61 | 208.09 | 197.53 | 179.61 |
| V-THETA 10 | 148.95 | 145.40 | 141.37 | 143.31 | 145.68 |
| M 9 | 0.3173 | 0.2987 | 0.2904 | 0.2892 | 0.2798 |
| M 10 | 0.2857 | 0.2811 | 0.2715 | 0.2827 | 0.2861 |
| TURN | 13.494 | 12.514 | 12.161 | 10.718 | 7.940 |
| $\bar{\omega}$ | 0.2217 | 0.1295 | 0.1729 | 0.0927 | 0.0692 |
| DFAC | 0.1812 | 0.1396 | 0.1525 | 0.1005 | 0.0309 |
| EFFP | 0.0097 | -0.0626 | -0.2452 | -1.1556 | 1.8556 |
| INCIDM | -8.548 | -5.969 | -3.751 | -5.288 | -9.955 |
| DEVM | 10.558 | 9.118 | 9.288 | 8.995 | 10.004 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.869 | 25.392 | 24.148 | 22.016 | 18.975 |
| BETA 7 | 43.055 | 41.685 | 41.208 | 39.169 | 36.394 |
| BETA(PR) 6 | 43.310 | 50.803 | 56.173 | 60.476 | 65.181 |
| BETA(PR) 7 | 21.192 | 35.428 | 43.772 | 49.876 | 55.462 |
| V 6 | 241.63 | 242.86 | 243.84 | 243.79 | 231.73 |
| V 7 | 353.23 | 328.02 | 319.04 | 316.25 | 308.20 |
| VZ 6 | 213.56 | 219.25 | 222.47 | 226.00 | 219.13 |
| VZ 7 | 256.93 | 244.79 | 239.93 | 245.15 | 248.16 |
| V-THETA 6 | 112.95 | 104.14 | 99.75 | 91.39 | 75.35 |
| V-THETA 7 | 241.15 | 218.15 | 210.18 | 199.74 | 182.92 |
| V(PR) 6 | 293.5 | 347.0 | 399.6 | 458.6 | 522.1 |
| V(PR) 7 | 276.8 | 300.6 | 332.4 | 380.5 | 437.7 |
| VTHETA PR6 | -201.3 | -268.9 | -332.0 | -399.1 | -473.8 |
| VTHETA PR7 | -100.1 | -174.3 | -229.9 | -290.9 | -360.6 |
| U 6 | 314.27 | 373.00 | 431.73 | 490.46 | 549.19 |
| U 7 | 341.22 | 392.42 | 440.13 | 490.66 | 543.47 |
| M 6 | 0.2175 | 0.2186 | 0.2195 | 0.2194 | 0.2085 |
| M 7 | 0.3172 | 0.2942 | 0.2859 | 0.2831 | 0.2757 |
| M(PR) 6 | 0.2642 | 0.3123 | 0.3597 | 0.4128 | 0.4697 |
| M(PR) 7 | 0.2486 | 0.2696 | 0.2978 | 0.3406 | 0.3914 |
| TURN(PR) | 22.113 | 15.357 | 12.397 | 10.599 | 9.719 |
| $\bar{\omega}$ | 0.0106 | 0.0469 | 0.0506 | 0.0446 | 0.0623 |
| DFAC | .2282 | .2686 | .2864 | .2758 | .2576 |
| EFFP | 1.0078 | 1.0347 | 1.0092 | 1.0000 | 0.9658 |
| EFF | 1.0079 | 1.0349 | 1.0093 | 1.0000 | 0.9655 |
| INCIDM | -5.290 | -1.697 | 0.073 | 0.876 | 1.981 |
| DEVM | 2.392 | 2.928 | 1.672 | 1.276 | 2.562 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| 70 PERCENT SPEED PT. 168 | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 4240. | 118.8 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 27.752 | 27.942 | 26.346 | 24.417 | 34.815 |
| V 3 | 184.67 | 192.96 | 197.38 | 198.82 | 196.41 |
| V 4 | 212.14 | 222.14 | 228.94 | 235.57 | 255.22 |
| VZ 3 | 184.67 | 192.69 | 197.38 | 198.81 | 196.41 |
| VZ 4 | 187.71 | 195.43 | 205.02 | 214.42 | 209.53 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 98.78 | 104.09 | 101.60 | 97.38 | 145.71 |
| M 3 | 0.1659 | 0.1734 | 0.1774 | 0.1787 | 0.1765 |
| M 4 | 0.1907 | 0.1998 | 0.2059 | 0.2120 | 0.2298 |
| TURN | -27.75 | -27.94 | -26.35 | -24.42 | -34.81 |
| $\bar{\omega}$ | 0.0481 | | 0.0476 | | 0.0420 |
| DFAC | 0.125 | 0.122 | 0.099 | 0.061 | 0.071 |
| EFFP | 0.9195 | 0.8930 | 0.9092 | 1.0001 | 0.9537 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 8.248 | 6.358 | 6.154 | 6.483 | -5.815 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 57.059 | 56.334 | 55.120 | 53.905 | 61.280 |
| BETA 10 | 37.892 | 26.491 | 25.119 | 25.604 | 23.217 |
| V 9 | 405.26 | 404.65 | 414.88 | 431.61 | 475.93 |
| V 10 | 139.20 | 253.06 | 295.86 | 332.72 | 355.65 |
| VZ 9 | 216.29 | 223.08 | 236.91 | 254.27 | 228.56 |
| VZ 10 | 107.54 | 224.73 | 267.26 | 299.99 | 326.79 |
| V-THETA 9 | 340.11 | 336.79 | 340.35 | 348.76 | 417.38 |
| V-THETA 10 | 85.50 | 112.88 | 125.59 | 143.79 | 140.20 |
| M 9 | 0.3607 | 0.3597 | 0.3679 | 0.3818 | 0.4214 |
| M 10 | 0.1225 | 0.2234 | 0.2610 | 0.2928 | 0.3125 |
| TURN | 19.166 | 29.843 | 30.001 | 28.301 | 38.063 |
| $\bar{\omega}$ | 0.5982 | 0.3502 | 0.2426 | 0.2095 | 0.1604 |
| DFAC | 0.8908 | 0.5992 | 0.5126 | 0.4501 | 0.5307 |
| EFFP | 0.3561 | 0.4970 | 0.6198 | 0.5706 | 0.6810 |
| INCIDM | 7.159 | 10.234 | 11.420 | 10.905 | 16.280 |
| DEVM | 20.592 | 7.991 | 6.619 | 7.604 | 6.117 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 25.011 | 26.050 | 24.810 | 23.131 | 37.590 |
| BETA 7 | 56.382 | 57.580 | 56.766 | 55.241 | 61.586 |
| BETA(PR) 6 | 58.711 | 63.018 | 66.221 | 68.591 | 70.114 |
| BETA(PR) 7 | 27.473 | 42.261 | 49.454 | 53.176 | 60.080 |
| V 6 | 226.11 | 233.13 | 239.76 | 246.59 | 269.95 |
| V 7 | 419.16 | 405.78 | 410.19 | 426.69 | 438.45 |
| VZ 6 | 204.83 | 209.30 | 217.54 | 226.74 | 213.90 |
| VZ 7 | 229.56 | 217.27 | 224.64 | 243.21 | 208.62 |
| V-THETA 6 | 95.60 | 102.38 | 100.60 | 96.87 | 164.67 |
| V-THETA 7 | 349.06 | 342.53 | 343.10 | 350.55 | 385.63 |
| V(PR) 6 | 394.4 | 461.4 | 539.6 | 621.2 | 678.8 |
| V(PR) 7 | 261.6 | 293.9 | 345.8 | 405.9 | 418.3 |
| VTHETA PR6 | -337.0 | -411.1 | -493.7 | -578.3 | -591.4 |
| VTHETA PR7 | -120.7 | -197.7 | -262.8 | -324.9 | -362.5 |
| U 6 | 432.63 | 513.48 | 594.33 | 675.18 | 756.02 |
| U 7 | 469.73 | 540.21 | 605.89 | 675.45 | 748.16 |
| M 6 | 0.2034 | 0.2097 | 0.2158 | 0.2220 | 0.2432 |
| M 7 | 0.3734 | 0.3607 | 0.3637 | 0.3774 | 0.3872 |
| M(PR) 6 | 0.3548 | 0.4151 | 0.4856 | 0.5592 | 0.5666 |
| M(PR) 7 | 0.2330 | 0.2613 | 0.3067 | 0.3590 | 0.3694 |
| TURN(PR) | 31.229 | 20.741 | 16.759 | 15.412 | 10.033 |
| $\bar{\omega}$ | 0.1144 | 0.1253 | 0.2031 | 0.1658 | -0.0184 |
| DFAC | .5794 | .5720 | .5497 | .5289 | .4984 |
| EFFP | 0.9734 | 1.0011 | 0.9703 | 0.9423 | 0.9110 |
| EFF | 0.9729 | 1.0011 | 0.9696 | 0.9409 | 0.9086 |
| INCIDM | 10.111 | 10.518 | 10.121 | 8.991 | 6.914 |
| DEVM | 8.673 | 9.761 | 7.354 | 4.576 | 7.180 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70 PERCENT SPEED | PT. 169 | CRUISE | 4255. | 125. |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 28.104 | 28.214 | 26.129 | 24.339 | 22.887 |
| V 3 | 193.01 | 202.45 | 207.55 | 210.51 | 211.44 |
| V 4 | 227.28 | 236.38 | 243.91 | 247.75 | 239.88 |
| VZ 3 | 193.00 | 202.20 | 207.55 | 210.50 | 211.43 |
| VZ 4 | 200.47 | 207.36 | 218.95 | 225.73 | 221.00 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 107.07 | 111.75 | 107.42 | 102.11 | 93.29 |
| M 3 | 0.1734 | 0.1819 | 0.1866 | 0.1892 | 0.1901 |
| M 4 | 0.2044 | 0.2127 | 0.2195 | 0.2230 | 0.2159 |
| TURN | -28.10 | -28.21 | -26.13 | -24.34 | -22.89 |
| $\bar{\omega}$ | 0.0559 | | 0.0297 | | 0.0470 |
| DFAC | 0.107 | 0.112 | 0.085 | 0.067 | 0.086 |
| EFFP | 0.8755 | 0.8710 | 0.8889 | 0.9645 | 0.8260 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 7.896 | 6.086 | 6.371 | 6.561 | 6.113 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 57.432 | 51.155 | 56.208 | 54.559 | 49.411 |
| BETA 10 | 29.828 | 25.604 | 25.779 | 25.819 | 23.346 |
| V 9 | 412.33 | 413.43 | 415.40 | 430.00 | 436.45 |
| V 10 | 185.29 | 290.13 | 292.46 | 337.50 | 363.94 |
| VZ 9 | 217.86 | 257.90 | 230.51 | 249.19 | 283.97 |
| VZ 10 | 158.02 | 259.67 | 262.54 | 303.56 | 334.15 |
| V-THETA 9 | 347.49 | 322.00 | 345.22 | 350.32 | 331.44 |
| V-THETA 10 | 92.16 | 125.38 | 127.19 | 146.99 | 144.22 |
| M 9 | 0.3671 | 0.3684 | 0.3684 | 0.3804 | 0.3858 |
| M 10 | 0.1632 | 0.2575 | 0.2579 | 0.2970 | 0.3203 |
| TURN | 27.604 | 25.550 | 30.429 | 28.739 | 26.065 |
| $\bar{\omega}$ | 0.4871 | 0.1942 | 0.2387 | 0.1844 | 0.1740 |
| DFAC | 0.7813 | 0.4907 | 0.5249 | 0.4351 | 0.3712 |
| EFFP | 0.4153 | 1.0757 | 0.6335 | 0.5565 | 0.4033 |
| INCIDM | 7.532 | 5.055 | 12.508 | 11.559 | 4.411 |
| DEVM | 12.528 | 7.104 | 7.279 | 7.819 | 6.246 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 25.479 | 26.108 | 24.920 | 23.289 | 21.775 |
| BETA 7 | 57.453 | 52.476 | 57.514 | 56.204 | 51.807 |
| BETA(PR) 6 | 56.659 | 61.041 | 65.017 | 67.742 | 70.630 |
| BETA(PR) 7 | 26.653 | 40.527 | 49.592 | 54.049 | 58.066 |
| V 6 | 240.94 | 249.95 | 251.95 | 256.71 | 251.85 |
| V 7 | 423.54 | 412.64 | 412.39 | 424.18 | 422.28 |
| VZ 6 | 217.45 | 224.28 | 228.44 | 235.77 | 233.88 |
| VZ 7 | 226.08 | 251.08 | 221.37 | 235.91 | 261.10 |
| V-THETA 6 | 103.65 | 110.00 | 106.16 | 101.49 | 93.43 |
| V-THETA 7 | 357.02 | 327.26 | 347.86 | 352.50 | 331.88 |
| V(PR) 6 | 395.7 | 463.3 | 540.9 | 622.5 | 705.2 |
| V(PR) 7 | 254.9 | 330.7 | 341.7 | 401.9 | 493.6 |
| VTHETA PR6 | -330.5 | -405.3 | -490.3 | -576.1 | -665.3 |
| VTHETA PR7 | -114.4 | -214.9 | -260.2 | -325.3 | -418.9 |
| U 6 | 434.16 | 515.30 | 596.43 | 677.56 | 758.70 |
| U 7 | 471.39 | 542.13 | 608.03 | 677.84 | 750.81 |
| M 6 | 0.2168 | 0.2250 | 0.2268 | 0.2312 | 0.2268 |
| M 7 | 0.3773 | 0.3676 | 0.3657 | 0.3752 | 0.3729 |
| M(PR) 6 | 0.3561 | 0.4171 | 0.4870 | 0.5605 | 0.6349 |
| M(PR) 7 | 0.2271 | 0.2946 | 0.3030 | 0.3554 | 0.4359 |
| TURN(PR) | 29.999 | 20.497 | 15.420 | 13.691 | 12.564 |
| $\bar{\omega}$ | 0.1112 | 0.0938 | 0.1518 | 0.1260 | 0.1661 |
| DFAC | .5983 | .4936 | .5578 | .5344 | .4581 |
| EFFP | 0.9734 | 1.1008 | 0.9597 | 0.9376 | 0.9653 |
| EFF | 0.9729 | 1.1029 | 0.9588 | 0.9360 | 0.9644 |
| INCIDM | 8.059 | 8.541 | 8.917 | 8.142 | 7.430 |
| DEVM | 7.853 | 8.027 | 7.492 | 5.449 | 5.166 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70 PERCENT SPEED | PT. 170 | CRUISE | 4260. | 131. |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 27.905 | 28.223 | 26.087 | 24.317 | 23.385 |
| V 3 | 201.08 | 211.15 | 217.20 | 220.82 | 222.12 |
| V 4 | 239.85 | 248.42 | 255.14 | 258.08 | 252.82 |
| VZ 3 | 201.07 | 210.92 | 217.20 | 220.82 | 222.11 |
| VZ 4 | 211.95 | 217.76 | 229.13 | 235.19 | 232.05 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 112.25 | 117.48 | 112.19 | 106.27 | 100.35 |
| M 3 | 0.1807 | 0.1898 | 0.1953 | 0.1986 | 0.1998 |
| M 4 | 0.2158 | 0.2236 | 0.2297 | 0.2324 | 0.2276 |
| TURN | -27.90 | -28.22 | -26.09 | -24.32 | -23.39 |
| $\bar{\omega}$ | 0.0499 | | 0.0362 | | 0.0460 |
| DFAC | 0.093 | 0.105 | 0.085 | 0.073 | 0.087 |
| EFFP | 0.9153 | 0.8863 | 0.9222 | 0.9919 | 0.8922 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 8.095 | 6.077 | 6.413 | 6.583 | 5.615 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 53.534 | 52.407 | 54.579 | 52.541 | 47.807 |
| BETA 10 | 28.939 | 25.990 | 26.056 | 25.879 | 25.081 |
| V 9 | 432.34 | 423.50 | 420.83 | 432.42 | 445.65 |
| V 10 | 228.78 | 291.79 | 302.98 | 349.31 | 372.04 |
| VZ 9 | 252.22 | 256.67 | 243.23 | 262.81 | 299.32 |
| VZ 10 | 197.78 | 260.07 | 271.24 | 314.01 | 336.96 |
| V-THETA 9 | 347.69 | 335.56 | 342.94 | 343.25 | 330.18 |
| V-THETA 10 | 110.70 | 127.87 | 133.08 | 152.46 | 157.70 |
| M 9 | 0.3855 | 0.3772 | 0.3735 | 0.3830 | 0.3946 |
| M 10 | 0.2019 | 0.2581 | 0.2673 | 0.3079 | 0.3279 |
| TURN | 24.595 | 26.417 | 28.523 | 26.662 | 22.726 |
| $\bar{\omega}$ | 0.3440 | 0.1928 | 0.1874 | 0.1207 | 0.1575 |
| DFAC | 0.6740 | 0.5096 | 0.4974 | 0.3975 | 0.3504 |
| EFFP | 0.5606 | 0.6823 | 0.6868 | 0.6695 | 0.4987 |
| INCIDM | 3.634 | 6.307 | 10.079 | 9.541 | 2.807 |
| DEVM | 11.639 | 7.490 | 7.556 | 7.879 | 7.981 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 25.238 | 26.307 | 24.834 | 23.171 | 22.345 |
| BETA 7 | 54.041 | 53.696 | 55.887 | 54.311 | 49.976 |
| BETA(PR) 6 | 54.798 | 59.745 | 63.786 | 66.709 | 69.501 |
| BETA(PR) 7 | 23.765 | 38.801 | 48.354 | 53.268 | 56.845 |
| V 6 | 254.45 | 260.72 | 263.89 | 268.24 | 266.15 |
| V 7 | 441.90 | 423.39 | 417.36 | 425.76 | 429.48 |
| VZ 6 | 230.11 | 233.53 | 239.44 | 246.59 | 246.16 |
| VZ 7 | 257.77 | 250.45 | 233.95 | 248.35 | 276.20 |
| V-THETA 6 | 108.49 | 115.54 | 110.83 | 105.55 | 101.18 |
| V-THETA 7 | 357.69 | 341.20 | 345.54 | 345.80 | 328.88 |
| V(PR) 6 | 399.2 | 463.6 | 542.1 | 623.6 | 702.9 |
| V(PR) 7 | 283.5 | 321.7 | 352.2 | 415.3 | 505.0 |
| VTHETA PR6 | -326.2 | -400.4 | -486.3 | -572.8 | -658.4 |
| VTHETA PR7 | -114.3 | -201.6 | -263.2 | -332.8 | -422.8 |
| U 6 | 434.67 | 515.90 | 597.13 | 678.36 | 759.59 |
| U 7 | 471.94 | 542.76 | 608.75 | 678.64 | 751.69 |
| M 6 | 0.2291 | 0.2348 | 0.2377 | 0.2417 | 0.2398 |
| M 7 | 0.3943 | 0.3772 | 0.3705 | 0.3770 | 0.3799 |
| M(PR) 6 | 0.3595 | 0.4175 | 0.4883 | 0.5619 | 0.6332 |
| M(PR) 7 | 0.2530 | 0.2865 | 0.3127 | 0.3678 | 0.4467 |
| TURN(PR) | 31.027 | 20.924 | 15.428 | 13.440 | 12.656 |
| $\bar{\omega}$ | 0.1034 | 0.0840 | 0.1029 | 0.0856 | 0.0874 |
| DFAC | .5266 | .5022 | .5341 | .5060 | .4329 |
| EFFP | 0.9702 | 1.0394 | 0.9531 | 0.9429 | 0.9820 |
| EFF | 0.9696 | 1.0402 | 0.9521 | 0.9415 | 0.9815 |
| INCIDM | 6.198 | 7.245 | 7.686 | 7.109 | 6.301 |
| DEVM | 4.965 | 6.301 | 6.254 | 4.666 | 3.945 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70 PERCENT SPEED | PT.171 | CRUISE | 4245. | 140.06 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 28.166 | 28.252 | 26.588 | 24.418 | 23.912 |
| V 3 | 214.18 | 225.45 | 232.77 | 236.88 | 237.32 |
| V 4 | 256.86 | 265.72 | 276.96 | 278.11 | 270.99 |
| VZ 3 | 214.17 | 225.20 | 232.76 | 236.88 | 237.31 |
| VZ 4 | 226.44 | 232.79 | 247.66 | 253.23 | 247.73 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 121.25 | 125.78 | 123.96 | 114.97 | 109.84 |
| M 3 | 0.1926 | 0.2028 | 0.2094 | 0.2132 | 0.2135 |
| M 4 | 0.2313 | 0.2394 | 0.2496 | 0.2507 | 0.2442 |
| TURN | -28.17 | -28.25 | -26.59 | -24.42 | -23.91 |
| $\bar{\omega}$ | 0.0460 | | 0.0307 | | 0.0320 |
| DFAC | 0.091 | 0.104 | 0.078 | 0.070 | 0.089 |
| EFFP | 0.8887 | 0.8867 | 1.0825 | 1.2081 | 1.0722 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 7.834 | 6.048 | 5.912 | 6.482 | 5.088 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 50.157 | 50.079 | 52.668 | 48.183 | 46.102 |
| BETA 10 | 27.622 | 26.812 | 26.757 | 25.624 | 26.087 |
| V 9 | 447.37 | 432.74 | 431.63 | 442.14 | 442.40 |
| V 10 | 303.72 | 317.13 | 318.63 | 364.24 | 385.04 |
| VZ 9 | 281.61 | 275.80 | 261.04 | 294.67 | 306.73 |
| VZ 10 | 266.74 | 280.73 | 283.63 | 328.24 | 345.79 |
| V-THETA 9 | 343.49 | 331.88 | 343.21 | 329.52 | 318.78 |
| V-THETA 10 | 140.81 | 143.05 | 143.45 | 157.52 | 169.32 |
| M 9 | 0.3997 | 0.3861 | 0.3838 | 0.3929 | 0.3926 |
| M 10 | 0.2691 | 0.2811 | 0.2815 | 0.3221 | 0.3404 |
| TURN | 22.536 | 23.267 | 25.911 | 22.560 | 20.015 |
| $\bar{\omega}$ | 0.1768 | 0.1283 | 0.1837 | 0.1146 | 0.1065 |
| DFAC | 0.4872 | 0.4434 | 0.4633 | 0.3572 | 0.2916 |
| EFFP | 0.7280 | 0.7807 | 0.6571 | 0.6727 | 0.6165 |
| INCIDM | 0.257 | 3.979 | 8.968 | 5.183 | 1.102 |
| DEVM | 10.322 | 8.312 | 8.257 | 7.624 | 8.987 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 25.436 | 26.298 | 25.162 | 23.174 | 23.225 |
| BETA 7 | 51.330 | 51.357 | 54.049 | 49.756 | 47.488 |
| BETA(PR) 6 | 52.067 | 57.383 | 61.277 | 64.516 | 68.146 |
| BETA(PR) 7 | 22.410 | 37.118 | 45.866 | 50.870 | 55.638 |
| V 6 | 272.78 | 278.96 | 286.55 | 291.09 | 281.83 |
| V 7 | 452.88 | 431.43 | 428.81 | 434.21 | 434.12 |
| VZ 6 | 246.28 | 249.89 | 259.31 | 267.59 | 258.99 |
| VZ 7 | 281.44 | 269.16 | 251.64 | 280.49 | 293.35 |
| V-THETA 6 | 117.16 | 123.59 | 121.84 | 114.55 | 111.14 |
| V-THETA 7 | 353.59 | 336.97 | 347.13 | 331.43 | 320.00 |
| V(PR) 6 | 400.7 | 463.7 | 539.6 | 621.9 | 695.8 |
| V(PR) 7 | 306.1 | 337.9 | 361.5 | 444.5 | 519.7 |
| VTHETA PR6 | -316.0 | -390.5 | -473.2 | -561.4 | -645.8 |
| VTHETA PR7 | -116.7 | -203.9 | -259.5 | -344.8 | -429.0 |
| U 6 | 433.14 | 514.09 | 595.03 | 675.97 | 756.91 |
| U 7 | 470.28 | 540.85 | 606.61 | 676.25 | 749.04 |
| M 6 | 0.2458 | 0.2515 | 0.2584 | 0.2625 | 0.2541 |
| M 7 | 0.4048 | 0.3849 | 0.3813 | 0.3857 | 0.3851 |
| M(PR) 6 | 0.3611 | 0.4180 | 0.4866 | 0.5609 | 0.6272 |
| M(PR) 7 | 0.2736 | 0.3015 | 0.3215 | 0.3948 | 0.4610 |
| TURN(PR) | 29.650 | 20.245 | 15.407 | 13.645 | 12.508 |
| $\bar{\omega}$ | 0.0686 | 0.0593 | 0.0706 | 0.0619 | 0.0257 |
| DFAC | .4609 | .4573 | .5075 | .4416 | .3932 |
| EFFP | 0.9564 | 1.0084 | 0.9174 | 0.9701 | 0.9936 |
| EFF | 0.9557 | 1.0086 | 0.9158 | 0.9694 | 0.9934 |
| INCIDM | 3.467 | 4.883 | 5.177 | 4.916 | 4.946 |
| DEVM | 3.610 | 4.618 | 3.766 | 2.270 | 2.738 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70 PERCENT SPEED | PT.173 | CRUISE | 4260. | 152.6 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 28.256 | 28.051 | 26.290 | 24.567 | 22.381 |
| V 3 | 235.25 | 247.41 | 254.97 | 258.84 | 259.18 |
| V 4 | 288.66 | 295.05 | 300.96 | 301.02 | 293.51 |
| VZ 3 | 235.24 | 247.21 | 254.96 | 258.83 | 259.16 |
| VZ 4 | 254.27 | 258.98 | 269.83 | 273.77 | 271.40 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 136.65 | 138.75 | 133.30 | 125.15 | 111.76 |
| M 3 | 0.2117 | 0.2227 | 0.2296 | 0.2331 | 0.2334 |
| M 4 | 0.2603 | 0.2662 | 0.2716 | 0.2716 | 0.2647 |
| TURN | -28.26 | -28.05 | -26.29 | -24.57 | -22.38 |
| $\bar{\omega}$ | 0.0482 | | 0.0324 | | 0.0410 |
| DFAC | 0.071 | 0.092 | 0.083 | 0.080 | 0.083 |
| EFFP | 0.9746 | 0.9142 | 0.9628 | 1.0073 | 0.9200 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 7.744 | 6.249 | 6.210 | 6.333 | 6.619 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 43.882 | 45.037 | 46.245 | 43.077 | 41.748 |
| BETA 10 | 26.980 | 27.721 | 26.714 | 25.620 | 28.200 |
| V 9 | 451.58 | 438.72 | 433.59 | 439.55 | 432.83 |
| V 10 | 370.82 | 367.73 | 361.46 | 391.36 | 412.45 |
| VZ 9 | 319.85 | 308.02 | 299.25 | 321.01 | 322.89 |
| VZ 10 | 328.40 | 323.09 | 322.13 | 352.80 | 363.44 |
| V-THETA 9 | 313.03 | 310.42 | 313.19 | 300.21 | 288.20 |
| V-THETA 10 | 168.24 | 171.05 | 162.49 | 169.23 | 194.91 |
| M 9 | 0.4050 | 0.3927 | 0.3871 | 0.3921 | 0.3852 |
| M 10 | 0.3308 | 0.3277 | 0.3213 | 0.3480 | 0.3666 |
| TURN | 16.901 | 17.317 | 19.532 | 17.457 | 13.547 |
| $\bar{\omega}$ | 0.1439 | 0.1413 | 0.1761 | 0.1299 | 0.0666 |
| DFAC | 0.2938 | 0.2888 | 0.3171 | 0.2483 | 0.1511 |
| EFFP | 0.6176 | 0.5893 | 0.4494 | 0.4366 | 0.4681 |
| INCIDM | -6.018 | -1.063 | 2.545 | 0.077 | -3.252 |
| DEVM | 9.680 | 9.221 | 8.214 | 7.620 | 11.100 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 25.452 | 25.983 | 24.792 | 23.101 | 21.679 |
| BETA 7 | 45.287 | 46.492 | 47.521 | 44.811 | 43.027 |
| BETA(PR) 6 | 47.482 | 53.650 | 58.500 | 62.400 | 66.495 |
| BETA(PR) 7 | 25.097 | 37.234 | 45.418 | 50.726 | 56.027 |
| V 6 | 307.33 | 310.99 | 314.18 | 315.26 | 303.10 |
| V 7 | 453.72 | 434.74 | 427.86 | 431.61 | 425.35 |
| VZ 6 | 277.46 | 279.39 | 285.19 | 289.97 | 281.66 |
| VZ 7 | 317.66 | 299.11 | 288.85 | 306.17 | 310.94 |
| V-THETA 6 | 132.08 | 136.25 | 131.75 | 123.69 | 111.97 |
| V-THETA 7 | 322.43 | 315.30 | 315.56 | 304.19 | 290.23 |
| V(PR) 6 | 410.6 | 471.5 | 545.8 | 625.9 | 706.2 |
| V(PR) 7 | 352.5 | 375.9 | 411.6 | 483.7 | 556.4 |
| VTHETA PR6 | -302.6 | -379.7 | -465.4 | -554.7 | -647.6 |
| VTHETA PR7 | -149.5 | -227.5 | -293.2 | -374.4 | -461.5 |
| U 6 | 434.67 | 515.90 | 597.13 | 678.36 | 759.59 |
| U 7 | 471.94 | 542.76 | 608.75 | 678.64 | 751.69 |
| M 6 | 0.2774 | 0.2808 | 0.2837 | 0.2847 | 0.2735 |
| M 7 | 0.4069 | 0.3891 | 0.3819 | 0.3848 | 0.3784 |
| M(PR) 6 | 0.3706 | 0.4256 | 0.4928 | 0.5652 | 0.6373 |
| M(PR) 7 | 0.3162 | 0.3364 | 0.3674 | 0.4313 | 0.4951 |
| TURN(PR) | 22.379 | 16.400 | 13.079 | 11.674 | 10.468 |
| $\bar{\omega}$ | 0.0620 | 0.0388 | 0.0336 | 0.0399 | 0.0190 |
| DFAC | .3209 | .3575 | .3895 | .3559 | .3298 |
| EFFP | 1.0677 | 1.1058 | 1.0342 | 1.0632 | 1.0336 |
| EFF | 1.0688 | 1.1076 | 1.0348 | 1.0645 | 1.0343 |
| INCIDM | -1.118 | 1.150 | 2.400 | 2.800 | 3.295 |
| DEVM | 6.297 | 4.734 | 3.318 | 2.126 | 3.127 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70 PERCENT SPEED | PT. 167 | CRUISE | 4255. | 166. |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 28.581 | 28.195 | 26.357 | 24.605 | 23.856 |
| W 3 | 258.40 | 271.37 | 279.48 | 283.62 | 284.36 |
| W 4 | 317.14 | 326.54 | 330.48 | 330.36 | 321.47 |
| WZ 3 | 258.38 | 271.15 | 279.46 | 283.61 | 284.35 |
| WZ 4 | 278.49 | 286.38 | 296.12 | 300.37 | 294.00 |
| W-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| W-THETA 4 | 151.72 | 154.29 | 146.72 | 137.55 | 130.02 |
| M 3 | 0.2327 | 0.2445 | 0.2519 | 0.2557 | 0.2564 |
| M 4 | 0.2864 | 0.2950 | 0.2987 | 0.2985 | 0.2904 |
| TURN | -28.58 | -28.20 | -26.36 | -24.60 | -23.86 |
| $\bar{\omega}$ | 0.0518 | | 0.0347 | | 0.0110 |
| DFAC | 0.074 | 0.085 | 0.082 | 0.079 | 0.098 |
| EFFP | 0.9280 | 0.9062 | 0.9318 | 0.9880 | 0.8623 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 7.419 | 6.105 | 6.143 | 6.295 | 5.144 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 39.503 | 41.493 | 41.169 | 39.063 | 37.861 |
| BETA 10 | 27.821 | 28.262 | 27.647 | 25.978 | 25.576 |
| W 9 | 489.66 | 453.47 | 448.87 | 447.92 | 450.25 |
| W 10 | 447.99 | 431.74 | 417.95 | 432.50 | 444.04 |
| WZ 9 | 371.73 | 337.64 | 337.26 | 347.72 | 355.45 |
| WZ 10 | 393.62 | 377.72 | 369.46 | 388.71 | 400.48 |
| W-THETA 9 | 311.48 | 300.44 | 295.48 | 282.27 | 276.34 |
| W-THETA 10 | 209.09 | 204.43 | 193.94 | 189.44 | 191.70 |
| M 9 | 0.4410 | 0.4073 | 0.4025 | 0.4012 | 0.4026 |
| M 10 | 0.4022 | 0.3872 | 0.3740 | 0.3870 | 0.3968 |
| TURN | 11.681 | 13.231 | 13.522 | 13.086 | 12.284 |
| $\bar{\omega}$ | 0.2077 | 0.1343 | 0.1954 | 0.1245 | 0.1345 |
| DFAC | 0.1568 | 0.1309 | 0.1661 | 0.1309 | 0.1046 |
| EFFP | -0.2006 | -0.3292 | -0.2854 | -0.9187 | -3.2708 |
| INCIDM | -10.397 | -4.607 | -2.531 | -3.937 | -7.139 |
| DEVM | 10.521 | 9.762 | 9.147 | 7.976 | 8.476 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 25.478 | 26.157 | 24.974 | 23.370 | 23.131 |
| BETA 7 | 40.860 | 43.086 | 42.364 | 40.566 | 39.832 |
| BETA(PR) 6 | 43.065 | 49.766 | 55.277 | 59.697 | 63.988 |
| BETA(PR) 7 | 22.134 | 35.930 | 43.635 | 49.861 | 54.388 |
| W 6 | 340.85 | 343.27 | 344.74 | 344.41 | 333.15 |
| W 7 | 490.09 | 447.17 | 441.14 | 436.98 | 438.37 |
| WZ 6 | 307.66 | 307.95 | 312.47 | 316.15 | 306.37 |
| WZ 7 | 368.90 | 326.37 | 325.84 | 331.92 | 336.63 |
| W-THETA 6 | 146.62 | 151.32 | 145.55 | 136.62 | 130.88 |
| W-THETA 7 | 320.62 | 305.46 | 297.26 | 284.18 | 280.80 |
| W(PR) 6 | 421.1 | 476.9 | 548.6 | 626.6 | 698.6 |
| W(PR) 7 | 400.1 | 403.3 | 450.4 | 514.9 | 578.1 |
| WTHETA PR6 | -287.5 | -364.0 | -450.9 | -540.9 | -627.8 |
| WTHETA PR7 | -150.8 | -236.7 | -310.8 | -393.7 | -470.0 |
| U 6 | 434.16 | 515.30 | 596.43 | 677.56 | 758.70 |
| U 7 | 471.39 | 542.13 | 608.03 | 677.84 | 750.81 |
| M 6 | 0.3082 | 0.3104 | 0.3118 | 0.3115 | 0.3011 |
| M 7 | 0.4414 | 0.4014 | 0.3954 | 0.3911 | 0.3917 |
| M(PR) 6 | 0.3808 | 0.4313 | 0.4962 | 0.5667 | 0.6314 |
| M(PR) 7 | 0.3604 | 0.3621 | 0.4036 | 0.4609 | 0.5166 |
| TURN(PR) | 20.926 | 13.821 | 11.639 | 9.835 | 9.600 |
| $\bar{\omega}$ | 0.0600 | 0.0550 | 0.0413 | 0.0216 | -0.0228 |
| DFAC | .2115 | .2874 | .3038 | .2834 | .272[illegible] |
| EFFP | 1.0589 | 1.0385 | 1.0328 | 1.0404 | 1.0211 |
| EFF | 1.0598 | 1.0391 | 1.0333 | 1.0411 | 1.0215 |
| INCIDM | -5.535 | -2.734 | -0.823 | 0.097 | 0.788 |
| DEVM | 3.334 | 3.430 | 1.535 | 1.261 | 1.488 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

80PERCENT SPEED PT.175 | CONFIGURATION CRUISE | $N/\sqrt{\theta}$ 4810. | $\omega\sqrt{\theta}/\delta$ 138.0

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.178 | 27.880 | 26.088 | 23.381 | 20.275 |
| V 3 | 212.16 | 222.91 | 229.13 | 232.97 | 234.08 |
| V 4 | 245.99 | 258.51 | 269.00 | 273.09 | 266.24 |
| VZ 3 | 212.15 | 222.54 | 229.12 | 232.96 | 234.07 |
| VZ 4 | 212.62 | 227.36 | 241.52 | 250.65 | 249.75 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 123.66 | 120.88 | 118.29 | 108.37 | 92.26 |
| M 3 | 0.1907 | 0.2005 | 0.2061 | 0.2096 | 0.2106 |
| M 4 | 0.2214 | 0.2328 | 0.2424 | 0.2461 | 0.2399 |
| TURN | -30.18 | -27.88 | -26.09 | -23.38 | -20.28 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.139 | 0.115 | 0.086 | 0.061 | 0.059 |
| EFFP | 0.8606 | 0.8844 | 0.9345 | 0.9926 | 0.8707 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.822 | 6.420 | 6.412 | 7.519 | 8.725 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 60.417 | 55.432 | 57.408 | 53.796 | 47.454 |
| BETA 10 | 37.741 | 26.327 | 25.407 | 25.791 | 21.343 |
| V 9 | 461.79 | 462.78 | 467.38 | 486.77 | 500.75 |
| V 10 | 143.68 | 275.69 | 346.45 | 383.11 | 412.24 |
| VZ 9 | 223.88 | 260.78 | 250.99 | 287.32 | 338.60 |
| VZ 10 | 111.28 | 244.73 | 311.68 | 344.62 | 383.96 |
| V-THETA 9 | 401.59 | 381.08 | 393.78 | 392.78 | 368.92 |
| V-THETA 10 | 87.94 | 122.27 | 148.64 | 166.69 | 150.03 |
| M 9 | 0.4101 | 0.4107 | 0.4129 | 0.4289 | 0.4407 |
| M 10 | 0.1257 | 0.2422 | 0.3044 | 0.3355 | 0.3606 |
| TURN | 22.676 | 29.104 | 32.001 | 28.005 | 26.110 |
| $\bar{\omega}$ | 0.6653 | 0.4558 | 0.2493 | 0.2496 | 0.2452 |
| DFAC | 0.9428 | 0.6315 | 0.4874 | 0.4291 | 0.3856 |
| EFFP | 0.2665 | 0.3138 | 0.5901 | 0.3639 | 0.1756 |
| INCIDM | 10.517 | 9.332 | 13.708 | 10.796 | 2.454 |
| DEVM | 20.441 | 7.827 | 6.907 | 7.791 | 4.243 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.554 | 25.936 | 24.739 | 22.059 | 19.054 |
| BETA 7 | 59.644 | 56.627 | 58.925 | 55.652 | 49.924 |
| BETA(PR) 6 | 58.253 | 62.265 | 65.565 | 68.036 | 70.907 |
| BETA(PR) 7 | 26.477 | 41.400 | 50.406 | 53.906 | 56.830 |
| V 6 | 259.01 | 271.45 | 278.99 | 286.51 | 280.55 |
| V 7 | 478.08 | 464.25 | 464.25 | 479.05 | 484.95 |
| VZ 6 | 229.54 | 243.85 | 253.29 | 265.50 | 265.17 |
| VZ 7 | 239.22 | 255.02 | 239.43 | 270.22 | 312.21 |
| V-THETA 6 | 119.81 | 118.72 | 116.75 | 107.60 | 91.59 |
| V-THETA 7 | 412.54 | 387.69 | 397.63 | 395.52 | 371.08 |
| V(PR) 6 | 436.3 | 524.1 | 612.4 | 709.9 | 810.7 |
| V(PR) 7 | 269.9 | 340.5 | 376.0 | 458.8 | 570.6 |
| VTHETA PR6 | -371.0 | -463.8 | -557.5 | -658.3 | -766.1 |
| VTHETA PR7 | -120.3 | -225.1 | -289.7 | -370.7 | -477.7 |
| U 6 | 490.79 | 582.51 | 674.23 | 765.94 | 857.66 |
| U 7 | 532.87 | 612.84 | 687.34 | 766.26 | 848.74 |
| M 6 | 0.2333 | 0.2446 | 0.2515 | 0.2583 | 0.2529 |
| M 7 | 0.4251 | 0.4120 | 0.4102 | 0.4220 | 0.4264 |
| M(PR) 6 | 0.3929 | 0.4723 | 0.5520 | 0.6401 | 0.7308 |
| M(PR) 7 | 0.2400 | 0.3021 | 0.3322 | 0.4042 | 0.5017 |
| TURN(PR) | 31.767 | 20.841 | 15.151 | 14.128 | 14.077 |
| $\bar{\omega}$ | 0.0103 | 0.1035 | 0.1687 | 0.1511 | 0.2420 |
| DFAC | .6353 | .5565 | .5805 | .5348 | .4574 |
| EFFP | 0.9947 | 1.0549 | 0.9665 | 0.9594 | 0.9798 |
| EFF | 0.9946 | 1.0564 | 0.9655 | 0.9581 | 0.9791 |
| INCIDM | 9.653 | 9.765 | 9.465 | 8.436 | 7.707 |
| DEVM | 7.677 | 8.900 | 8.306 | 5.306 | 3.930 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80PERCENT SPEED PT.177 | CRUISE | 4820. | 147.5 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.299 | 27.744 | 26.072 | 23.137 | 21.434 |
| V 3 | 228.14 | 240.02 | 246.95 | 250.46 | 247.07 |
| V 4 | 266.98 | 276.09 | 282.36 | 286.16 | 297.29 |
| VZ 3 | 228.14 | 239.59 | 246.94 | 250.45 | 247.06 |
| VZ 4 | 230.48 | 243.09 | 253.43 | 262.91 | 276.63 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 134.70 | 128.52 | 124.09 | 112.44 | 108.64 |
| M 3 | 0.2052 | 0.2160 | 0.2223 | 0.2255 | 0.2224 |
| M 4 | 0.2405 | 0.2488 | 0.2546 | 0.2580 | 0.2682 |
| TURN | -30.30 | -27.74 | -26.07 | -23.14 | -21.43 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.132 | 0.121 | 0.109 | 0.083 | 0.016 |
| EFFP | 0.9113 | 0.8911 | 0.9012 | 0.9676 | 0.9257 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.701 | 6.556 | 6.428 | 7.763 | 7.566 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 56.443 | 53.726 | 55.523 | 52.642 | 49.095 |
| BETA 10 | 30.201 | 25.654 | 26.018 | 25.775 | 24.436 |
| V 9 | 482.17 | 476.26 | 480.42 | 491.76 | 504.79 |
| V 10 | 214.20 | 328.88 | 339.01 | 393.41 | 425.00 |
| VZ 9 | 261.56 | 279.60 | 271.16 | 298.36 | 328.67 |
| VZ 10 | 182.34 | 293.62 | 303.51 | 354.04 | 386.80 |
| V-THETA 9 | 401.81 | 383.96 | 396.04 | 390.88 | 381.51 |
| V-THETA 10 | 107.75 | 142.38 | 148.71 | 171.07 | 175.81 |
| M 9 | 0.4291 | 0.4231 | 0.4250 | 0.4337 | 0.4448 |
| M 10 | 0.1879 | 0.2897 | 0.2975 | 0.3448 | 0.3723 |
| TURN | 26.243 | 28.072 | 29.505 | 26.867 | 24.658 |
| $\bar{\omega}$ | 0.4783 | 0.1884 | 0.2250 | 0.1543 | 0.1957 |
| DFAC | 0.7828 | 0.5150 | 0.5188 | 0.4080 | 0.3530 |
| EFFP | 0.4739 | 0.7058 | 0.6581 | 0.5952 | 0.3437 |
| INCIDM | 6.543 | 7.626 | 11.823 | 9.642 | 4.095 |
| DEVM | 12.901 | 7.154 | 7.518 | 7.275 | 7.336 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.653 | 25.837 | 24.631 | 21.802 | 20.281 |
| BETA 7 | 56.570 | 55.141 | 56.926 | 54.527 | 51.093 |
| BETA(PR) 6 | 55.491 | 60.419 | 64.290 | 66.962 | 68.513 |
| BETA(PR) 7 | 23.869 | 39.393 | 48.040 | 53.035 | 56.822 |
| V 6 | 280.73 | 289.00 | 293.31 | 300.52 | 314.88 |
| V 7 | 495.19 | 476.08 | 476.69 | 484.30 | 489.15 |
| VZ 6 | 248.55 | 259.85 | 266.45 | 278.94 | 295.36 |
| VZ 7 | 270.51 | 271.65 | 259.85 | 280.91 | 307.13 |
| V-THETA 6 | 130.29 | 125.95 | 122.24 | 111.61 | 109.14 |
| V-THETA 7 | 413.27 | 390.66 | 399.45 | 394.41 | 380.64 |
| V(PR) 6 | 438.8 | 526.5 | 614.3 | 712.8 | 806.3 |
| V(PR) 7 | 298.3 | 352.1 | 389.1 | 467.4 | 561.4 |
| VTHETA PR6 | -361.5 | -457.8 | -553.4 | -655.9 | -750.3 |
| VTHETA PR7 | -120.7 | -223.5 | -289.3 | -373.4 | -469.9 |
| U 6 | 491.81 | 583.72 | 675.63 | 767.53 | 859.44 |
| U 7 | 533.98 | 614.11 | 688.77 | 767.85 | 850.50 |
| M 6 | 0.2531 | 0.2606 | 0.2646 | 0.2712 | 0.2843 |
| M 7 | 0.4412 | 0.4230 | 0.4217 | 0.4270 | 0.4305 |
| M(PR) 6 | 0.3956 | 0.4748 | 0.5541 | 0.6432 | 0.7281 |
| M(PR) 7 | 0.2658 | 0.3128 | 0.3442 | 0.4121 | 0.4941 |
| TURN(PR) | 31.610 | 21.001 | 16.234 | 13.920 | 11.691 |
| $\bar{\omega}$ | -0.0069 | 0.0694 | 0.1172 | 0.1070 | 0.1606 |
| DFAC | .5652 | .5336 | .5580 | .5214 | .4631 |
| EFFP | 0.9859 | 1.0125 | 0.9422 | 0.9394 | 0.9713 |
| EFF | 0.9855 | 1.0128 | 0.9406 | 0.9375 | 0.9703 |
| INCIDM | 6.891 | 7.919 | 8.190 | 7.362 | 5.313 |
| DEVM | 5.069 | 6.893 | 5.940 | 4.435 | 3.922 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| 80PERCENT SPEED PT.178 | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 4804. | 157.9 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 3C.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.897 | 27.828 | 26.109 | 23.333 | 18.815 |
| V 3 | 243.56 | 256.10 | 263.74 | 268.37 | 269.70 |
| V 4 | 296.61 | 301.03 | 307.24 | 309.55 | 304.39 |
| VZ 3 | 243.55 | 255.80 | 263.74 | 268.36 | 269.69 |
| VZ 4 | 254.51 | 264.78 | 275.85 | 284.21 | 288.12 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 152.31 | 140.52 | 135.21 | 122.60 | 98.17 |
| M 3 | 0.2192 | 0.2306 | 0.2376 | 0.2418 | 0.2430 |
| M 4 | 0.2676 | 0.2716 | 0.2773 | 0.2794 | 0.2747 |
| TURN | -30.90 | -27.83 | -26.11 | -23.33 | -18.82 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.103 | 0.103 | 0.093 | 0.076 | 0.053 |
| EFFP | 0.9134 | 0.8416 | 0.8447 | 0.9286 | 0.8634 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.103 | 6.472 | 6.391 | 7.567 | 10.185 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 53.383 | 50.694 | 53.417 | 49.003 | 41.684 |
| BETA 10 | 27.931 | 26.422 | 26.224 | 25.541 | 26.223 |
| V 9 | 511.98 | 495.12 | 498.25 | 513.31 | 509.15 |
| V 10 | 294.95 | 349.24 | 360.76 | 409.96 | 435.48 |
| VZ 9 | 299.77 | 311.48 | 296.20 | 336.65 | 380.18 |
| VZ 10 | 257.79 | 310.15 | 322.70 | 369.77 | 390.59 |
| V-THETA 9 | 410.93 | 383.11 | 400.09 | 387.42 | 338.60 |
| V-THETA 10 | 138.15 | 155.4C | 159.41 | 176.76 | 192.43 |
| M 9 | 0.4570 | 0.4410 | 0.4417 | 0.4543 | 0.4495 |
| M 10 | 0.2597 | 0.3082 | 0.3171 | 0.3603 | 0.3824 |
| TURN | 25.452 | 24.272 | 27.193 | 23.462 | 15.461 |
| $\bar{\omega}$ | 0.2718 | 0.1197 | 0.1465 | 0.1027 | 0.1292 |
| DFAC | 0.6210 | 0.4806 | 0.4864 | 0.3923 | 0.2825 |
| EFFP | 0.6733 | 0.8138 | 0.7808 | 0.7558 | 0.7778 |
| INCIDM | 3.483 | 4.594 | 9.717 | 6.003 | -3.316 |
| DEVM | 10.631 | 7.922 | 7.724 | 7.541 | 9.123 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 28.114 | 25.786 | 24.581 | 21.892 | 17.477 |
| BETA 7 | 54.156 | 52.080 | 54.813 | 50.932 | 44.227 |
| BETA(PR) 6 | 51.128 | 57.318 | 61.705 | 64.819 | 68.373 |
| BETA(PR) 7 | 19.655 | 36.233 | 44.789 | 49.724 | 53.567 |
| V 6 | 313.19 | 316.64 | 319.93 | 326.05 | 316.54 |
| V 7 | 521.90 | 493.93 | 494.13 | 503.42 | 508.11 |
| VZ 6 | 276.16 | 284.87 | 290.86 | 302.51 | 301.92 |
| VZ 7 | 303.70 | 303.23 | 284.55 | 317.19 | 364.08 |
| V-THETA 6 | 147.58 | 137.74 | 133.09 | 121.57 | 95.06 |
| V-THETA 7 | 423.06 | 389.64 | 403.84 | 390.86 | 354.41 |
| V(PR) 6 | 440.1 | 527.7 | 613.7 | 711.0 | 819.2 |
| V(PR) 7 | 324.5 | 376.3 | 401.2 | 490.8 | 613.1 |
| VTHETA PR6 | -342.6 | -444.0 | -540.3 | -643.4 | -761.5 |
| VTHETA PR7 | -109.2 | -222.4 | -282.6 | -374.4 | -493.3 |
| U 6 | 490.18 | 581.78 | 673.39 | 764.99 | 856.59 |
| U 7 | 532.21 | 612.07 | 686.49 | 765.30 | 847.68 |
| M 6 | 0.2828 | 0.2859 | 0.2890 | 0.2946 | 0.2858 |
| M 7 | 0.4662 | 0.4400 | 0.4381 | 0.4453 | 0.4486 |
| M(PR) 6 | 0.3974 | 0.4765 | 0.5542 | 0.6424 | 0.7398 |
| M(PR) 7 | 0.2899 | 0.3352 | 0.3557 | 0.4341 | 0.5413 |
| TURN(PR) | 31.466 | 21.063 | 16.910 | 15.093 | 14.806 |
| $\bar{\omega}$ | 0.0068 | 0.0462 | 0.0862 | 0.0697 | 0.1274 |
| DFAC | .5019 | .4796 | .5336 | .4788 | .3996 |
| EFFP | 0.9496 | 1.0096 | 0.9241 | 0.9497 | 0.9720 |
| EFF | 0.9484 | 1.0099 | 0.9221 | 0.9481 | 0.9710 |
| INCIDM | 2.528 | 11.218 | 5.605 | 5.219 | 5.173 |
| DEVM | 0.855 | 3.733 | 2.689 | 1.124 | 0.667 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80PERCENT SPEED PT.179 | CRUISE | 4842. | 166.1 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.527 | 27.592 | 25.825 | 23.415 | 19.640 |
| V 3 | 255.08 | 269.45 | 278.54 | 284.09 | 285.32 |
| V 4 | 313.56 | 322.38 | 327.52 | 329.95 | 317.04 |
| VZ 3 | 255.07 | 269.16 | 278.53 | 284.08 | 285.31 |
| VZ 4 | 270.09 | 283.99 | 294.81 | 302.78 | 298.60 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 159.27 | 149.32 | 142.67 | 131.12 | 106.56 |
| M 3 | 0.2297 | 0.2428 | 0.2511 | 0.2561 | 0.2573 |
| M 4 | 0.2831 | 0.2912 | 0.2959 | 0.2982 | 0.2863 |
| TURN | -30.53 | -27.59 | -25.82 | -23.41 | -19.64 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.091 | 0.084 | 0.082 | 0.070 | 0.075 |
| EFFP | 0.8932 | 0.8930 | 0.8907 | 0.9843 | 0.7083 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.473 | 6.708 | 6.675 | 7.485 | 9.360 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 49.553 | 48.400 | 51.389 | 46.976 | 40.050 |
| BETA 10 | 27.500 | 27.129 | 27.202 | 25.853 | 26.501 |
| V 9 | 518.19 | 500.40 | 494.43 | 504.97 | 506.47 |
| V 10 | 373.41 | 382.24 | 374.88 | 423.37 | 453.97 |
| VZ 9 | 330.13 | 329.68 | 307.56 | 344.34 | 387.66 |
| VZ 10 | 328.74 | 337.16 | 332.26 | 380.74 | 406.25 |
| V-THETA 9 | 394.35 | 374.20 | 386.34 | 369.16 | 325.89 |
| V-THETA 10 | 172.42 | 174.30 | 171.37 | 184.62 | 202.57 |
| M 9 | 0.4636 | 0.4466 | 0.4391 | 0.4479 | 0.4487 |
| M 10 | 0.3307 | 0.3384 | 0.3303 | 0.3734 | 0.4006 |
| TURN | 22.053 | 21.271 | 24.187 | 21.123 | 13.549 |
| $\bar{\omega}$ | 0.1543 | 0.1209 | 0.1866 | 0.1299 | 0.1163 |
| DFAC | 0.4358 | 0.3971 | 0.4310 | 0.3316 | 0.2208 |
| EFFP | 0.7342 | 0.7638 | 0.6009 | 0.5815 | 0.5549 |
| INCIDM | -0.347 | 2.300 | 7.689 | 3.976 | -4.950 |
| DEVM | 10.200 | 8.629 | 8.702 | 7.853 | 9.401 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.767 | 25.601 | 24.407 | 22.037 | 18.435 |
| BETA 7 | 51.010 | 49.730 | 52.719 | 48.934 | 42.843 |
| BETA(PR) 6 | 49.290 | 55.283 | 60.124 | 63.421 | 67.401 |
| BETA(PR) 7 | 21.507 | 36.358 | 45.415 | 50.728 | 54.835 |
| V 6 | 330.69 | 338.44 | 339.68 | 346.09 | 332.65 |
| V 7 | 523.24 | 497.98 | 490.64 | 495.30 | 496.52 |
| VZ 6 | 292.55 | 304.96 | 309.27 | 320.79 | 315.58 |
| VZ 7 | 327.56 | 321.61 | 297.05 | 325.33 | 364.05 |
| V-THETA 6 | 154.06 | 146.24 | 140.36 | 129.86 | 105.20 |
| V-THETA 7 | 406.69 | 379.97 | 390.39 | 373.43 | 337.63 |
| V(PR) 6 | 448.6 | 535.6 | 620.9 | 717.0 | 821.2 |
| V(PR) 7 | 353.9 | 399.7 | 423.4 | 514.0 | 632.1 |
| VTHETA PR6 | -340.0 | -440.1 | -538.4 | -641.2 | -758.2 |
| VTHETA PR7 | -129.7 | -236.9 | -301.5 | -397.9 | -516.8 |
| U 6 | 494.06 | 586.39 | 678.71 | 771.04 | 863.36 |
| U 7 | 536.42 | 616.91 | 691.92 | 771.35 | 854.38 |
| M 6 | 0.2989 | 0.3060 | 0.3071 | 0.3130 | 0.3007 |
| M 7 | 0.4683 | 0.4444 | 0.4357 | 0.4391 | 0.4395 |
| M(PR) 6 | 0.4054 | 0.4842 | 0.5614 | 0.6485 | 0.7422 |
| M(PR) 7 | 0.3167 | 0.3567 | 0.3760 | 0.4557 | 0.5596 |
| TURN(PR) | 27.777 | 18.903 | 14.705 | 12.692 | 12.566 |
| $\bar{\omega}$ | 0.0004 | 0.0119 | 0.0613 | 0.0390 | 0.0780 |
| DFAC | .4276 | .4305 | .4893 | .4348 | .3625 |
| EFFP | 0.9878 | 1.0215 | 0.9250 | 0.9690 | 1.0229 |
| EFF | 0.9876 | 1.0220 | 0.9231 | 0.9681 | 1.0237 |
| INCIDM | 0.690 | 2.783 | 4.024 | 3.821 | 4.201 |
| DEVM | 2.707 | 3.858 | 3.315 | 2.128 | 1.935 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80PERCENT SPEED PT.180 | CRUISE | 4829. | 176.4 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 31.087 | 27.876 | 26.439 | 23.559 | 18.269 |
| V 3 | 273.48 | 288.16 | 297.40 | 302.65 | 303.80 |
| V 4 | 338.39 | 344.86 | 349.41 | 349.06 | 339.23 |
| VZ 3 | 273.46 | 287.87 | 297.39 | 302.64 | 303.79 |
| VZ 4 | 289.79 | 303.12 | 312.85 | 319.96 | 322.13 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 174.72 | 161.24 | 155.58 | 139.52 | 106.34 |
| M 3 | 0.2465 | 0.2599 | 0.2683 | 0.2731 | 0.2742 |
| M 4 | 0.3059 | 0.3119 | 0.3161 | 0.3158 | 0.3067 |
| TURN | -31.09 | -27.88 | -26.44 | -23.56 | -18.27 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.090 | 0.087 | 0.088 | 0.078 | 0.058 |
| EFFP | 0.9295 | 0.8987 | 0.9070 | 0.9738 | 0.8301 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.913 | 6.424 | 6.061 | 7.341 | 10.731 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 45.705 | 44.970 | 46.361 | 42.338 | 34.912 |
| BETA 10 | 27.287 | 27.968 | 27.310 | 26.002 | 26.490 |
| V 9 | 530.01 | 510.93 | 502.48 | 510.84 | 504.32 |
| V 10 | 430.50 | 425.05 | 420.90 | 451.19 | 473.12 |
| VZ 9 | 363.72 | 358.93 | 345.96 | 377.54 | 413.48 |
| VZ 10 | 380.08 | 372.46 | 373.06 | 405.44 | 423.35 |
| V-THETA 9 | 379.35 | 361.09 | 363.65 | 344.05 | 288.63 |
| V-THETA 10 | 197.36 | 199.34 | 193.11 | 197.80 | 211.03 |
| M 9 | 0.4759 | 0.4575 | 0.4483 | 0.4553 | 0.4482 |
| M 10 | 0.3836 | 0.3782 | 0.3733 | 0.4003 | 0.4196 |
| TURN | 18.418 | 17.002 | 19.051 | 16.336 | 8.421 |
| $\bar{\omega}$ | 0.1506 | 0.1580 | 0.1788 | 0.1384 | 0.1438 |
| DFAC | 0.3113 | 0.2946 | 0.3095 | 0.2500 | 0.1364 |
| EFFP | 0.6386 | 0.5770 | 0.4672 | 0.4186 | 0.4082 |
| INCIDM | -4.195 | -1.130 | 2.661 | -0.662 | -10.088 |
| DEVM | 9.987 | 9.468 | 8.810 | 8.002 | 9.390 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 28.125 | 25.729 | 24.765 | 22.079 | 16.911 |
| BETA 7 | 47.239 | 46.407 | 47.901 | 44.117 | 37.246 |
| BETA(PR) 6 | 45.650 | 52.564 | 57.677 | 61.612 | 66.128 |
| BETA(PR) 7 | 21.679 | 35.437 | 44.154 | 49.655 | 53.773 |
| V 6 | 358.77 | 363.24 | 365.15 | 367.84 | 351.05 |
| V 7 | 532.81 | 506.41 | 495.42 | 499.10 | 503.65 |
| VZ 6 | 316.34 | 326.98 | 331.51 | 340.84 | 335.87 |
| VZ 7 | 359.98 | 348.89 | 331.97 | 358.25 | 400.91 |
| V-THETA 6 | 169.12 | 157.69 | 152.96 | 138.27 | 102.11 |
| V-THETA 7 | 391.18 | 366.77 | 367.59 | 347.44 | 304.83 |
| V(PR) 6 | 452.6 | 538.1 | 620.0 | 716.9 | 829.9 |
| V(PR) 7 | 389.3 | 428.6 | 462.9 | 553.5 | 678.4 |
| VTHETA PR6 | -323.6 | -427.1 | -523.9 | -630.7 | -758.9 |
| VTHETA PR7 | -143.8 | -248.5 | -322.5 | -421.8 | -547.3 |
| U 6 | 492.73 | 584.81 | 676.89 | 768.97 | 861.05 |
| U 7 | 534.98 | 615.26 | 690.06 | 769.28 | 852.09 |
| M 6 | 0.3247 | 0.3289 | 0.3306 | 0.3331 | 0.3176 |
| M 7 | 0.4785 | 0.4533 | 0.4418 | 0.4445 | 0.4477 |
| M(PR) 6 | 0.4097 | 0.4872 | 0.5614 | 0.6493 | 0.7509 |
| M(PR) 7 | 0.3496 | 0.3836 | 0.4129 | 0.4929 | 0.6032 |
| TURN(PR) | 23.966 | 17.107 | 13.518 | 11.956 | 12.355 |
| $\bar{\omega}$ | -0.0165 | 0.0134 | 0.0307 | 0.0267 | 0.0855 |
| DFAC | .3306 | .3618 | .4010 | .3582 | .2134 |
| EFFP | 1.0057 | 1.0419 | 0.9748 | 1.0125 | 1.0336 |
| EFF | 1.0058 | 1.0429 | 0.9742 | 1.0128 | 1.0346 |
| INCIDM | -2.950 | 0.064 | 1.577 | 2.012 | 2.928 |
| DEVM | 2.879 | 2.937 | 2.054 | 1.055 | 0.873 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| 80PERCENT SPEED PT.174 | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 4850. | 189.0 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 31.109 | 27.957 | 26.242 | 23.706 | 19.921 |
| V 3 | 295.40 | 310.87 | 320.48 | 325.73 | 326.80 |
| V 4 | 369.11 | 373.79 | 375.61 | 376.99 | 368.23 |
| VZ 3 | 295.38 | 310.58 | 320.46 | 325.72 | 326.78 |
| VZ 4 | 316.03 | 328.41 | 336.87 | 345.16 | 346.20 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 190.71 | 175.24 | 166.08 | 151.56 | 125.46 |
| M 3 | 0.2665 | 0.2806 | 0.2895 | 0.2943 | 0.2953 |
| M 4 | 0.3343 | 0.3386 | 0.3403 | 0.3416 | 0.3335 |
| TURN | -31.11 | -27.96 | -26.24 | -23.71 | -19.92 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.081 | 0.083 | 0.089 | 0.076 | 0.065 |
| EFFP | 0.9360 | 0.8949 | 0.8631 | 0.9615 | 0.8679 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.891 | 6.343 | 6.258 | 7.194 | 9.079 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 41.238 | 40.419 | 40.238 | 37.721 | 32.394 |
| BETA 10 | 28.342 | 28.414 | 27.665 | 26.431 | 26.566 |
| V 9 | 552.29 | 521.05 | 513.60 | 514.38 | 502.56 |
| V 10 | 501.71 | 490.39 | 480.11 | 496.66 | 504.42 |
| VZ 9 | 408.32 | 394.11 | 391.34 | 406.83 | 424.26 |
| VZ 10 | 438.91 | 428.24 | 424.42 | 444.70 | 451.04 |
| V-THETA 9 | 364.06 | 337.83 | 331.77 | 314.71 | 269.24 |
| V-THETA 10 | 238.18 | 233.34 | 222.91 | 221.07 | 225.59 |
| M 9 | 0.4981 | 0.4686 | 0.4608 | 0.4608 | 0.4488 |
| M 10 | 0.4505 | 0.4400 | 0.4296 | 0.4443 | 0.4506 |
| TURN | 12.896 | 12.005 | 12.574 | 11.290 | 5.829 |
| $\bar{\omega}$ | 0.2215 | 0.1491 | 0.1817 | 0.1224 | 0.1493 |
| DFAC | 0.1704 | 0.1373 | 0.1561 | 0.1192 | 0.0391 |
| EFFP | -0.0368 | -0.1641 | -0.2726 | -0.7171 | 5.4352 |
| INCIDM | -8.662 | -5.681 | -3.462 | -5.279 | -12.606 |
| DEVM | 11.042 | 9.914 | 9.165 | 8.431 | 9.466 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 28.035 | 25.712 | 24.478 | 22.189 | 18.693 |
| BETA 7 | 42.882 | 42.004 | 41.703 | 39.425 | 34.799 |
| BETA(PR) 6 | 41.826 | 49.459 | 55.156 | 59.448 | 64.188 |
| BETA(PR) 7 | 21.703 | 35.757 | 43.628 | 49.526 | 53.909 |
| V 6 | 392.83 | 395.12 | 394.92 | 396.82 | 379.48 |
| V 7 | 552.70 | 513.12 | 503.33 | 501.60 | 504.26 |
| VZ 6 | 346.67 | 355.76 | 359.36 | 367.41 | 359.45 |
| VZ 7 | 403.07 | 380.99 | 375.60 | 387.39 | 414.06 |
| V-THETA 6 | 184.64 | 171.42 | 163.63 | 149.87 | 121.62 |
| V-THETA 7 | 376.11 | 343.37 | 334.85 | 318.55 | 287.78 |
| V(PR) 6 | 465.3 | 547.5 | 629.0 | 722.8 | 825.5 |
| V(PR) 7 | 435.9 | 469.9 | 519.2 | 596.9 | 702.9 |
| VTHETA PR6 | -310.2 | -415.9 | -516.2 | -622.4 | -743.2 |
| VTHETA PR7 | -161.2 | -274.6 | -358.2 | -454.1 | -568.9 |
| U 6 | 494.88 | 587.35 | 679.83 | 772.31 | 864.79 |
| U 7 | 537.31 | 617.93 | 693.06 | 772.63 | 855.80 |
| M 6 | 0.3563 | 0.3584 | 0.3583 | 0.3600 | 0.3439 |
| M 7 | 0.4985 | 0.4612 | 0.4513 | 0.4490 | 0.4505 |
| M(PR) 6 | 0.4220 | 0.4967 | 0.5706 | 0.6558 | 0.7482 |
| M(PR) 7 | 0.3931 | 0.4223 | 0.4655 | 0.5343 | 0.6280 |
| TURN(PR) | 20.117 | 13.683 | 11.523 | 9.920 | 10.279 |
| $\bar{\omega}$ | -0.0125 | 0.0519 | 0.0368 | 0.0347 | 0.0552 |
| DFAC | .2256 | .2711 | .2912 | .2783 | .2423 |
| EFFP | 1.0361 | 1.0653 | 1.0465 | 1.0370 | 1.0320 |
| EFF | 1.0367 | 1.0665 | 1.0474 | 1.0378 | 1.0327 |
| INCIDM | -6.774 | -3.041 | -0.944 | -0.152 | 0.988 |
| DEVM | 2.903 | 3.257 | 1.528 | 0.926 | 0.109 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 100 PERCENT SPEED | PT.190 | CRUISE | 6045. | 175.8 |

## INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.744 | 27.379 | 25.585 | 24.033 | 26.982 |
| V 3 | 283.24 | 295.68 | 300.90 | 300.86 | 288.29 |
| V 4 | 314.38 | 326.61 | 338.53 | 345.82 | 373.29 |
| VZ 3 | 283.23 | 294.90 | 300.89 | 300.85 | 288.28 |
| VZ 4 | 270.04 | 288.81 | 304.31 | 314.63 | 332.08 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 160.71 | 150.20 | 146.20 | 140.84 | 169.36 |
| M 3 | 0.2554 | 0.2667 | 0.2715 | 0.2715 | 0.2600 |
| M 4 | 0.2839 | 0.2951 | 0.3061 | 0.3128 | 0.3382 |
| TURN | -30.74 | -27.38 | -25.59 | -24.03 | -26.98 |
| $\bar{\omega}$ | 0.0666 | | 0.0285 | | 0.0320 |
| DFAC | 0.181 | 0.153 | 0.119 | 0.086 | -0.001 |
| EFFP | 0.8377 | 0.8431 | 0.9111 | 0.9778 | 0.9833 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.256 | 6.921 | 6.915 | 6.867 | 2.018 |

## STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 58.853 | 54.755 | 57.399 | 54.422 | 58.728 |
| BETA 10 | 41.794 | 26.575 | 25.489 | 26.099 | 26.332 |
| V 9 | 580.51 | 582.02 | 580.99 | 614.28 | 612.30 |
| V 10 | 178.60 | 356.26 | 422.91 | 468.15 | 519.26 |
| VZ 9 | 295.64 | 334.18 | 312.63 | 357.29 | 311.41 |
| VZ 10 | 130.08 | 316.39 | 380.94 | 420.37 | 464.75 |
| V-THETA 9 | 496.83 | 475.33 | 489.46 | 499.61 | 523.34 |
| V-THETA 10 | 119.03 | 159.38 | 181.99 | 205.95 | 230.33 |
| M 9 | 0.5137 | 0.5140 | 0.5094 | 0.5365 | 0.5323 |
| M 10 | 0.1545 | 0.3100 | 0.3676 | 0.4047 | 0.4479 |
| TURN | 17.059 | 28.180 | 31.911 | 28.323 | 32.396 |
| $\bar{\omega}$ | 0.7783 | 0.4749 | 0.2650 | 0.2829 | 0.2006 |
| DFAC | 0.9353 | 0.6082 | 0.5029 | 0.4603 | 0.3808 |
| EFFP | 0.2389 | 0.3469 | 0.6490 | 0.3931 | 0.2901 |
| INCIDM | 8.953 | 8.655 | 13.699 | 11.422 | 13.728 |
| DEVM | 24.494 | 8.075 | 6.989 | 8.099 | 9.232 |

## ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.708 | 25.276 | 24.255 | 22.746 | 25.909 |
| BETA 7 | 57.996 | 55.998 | 59.161 | 55.867 | 61.340 |
| BETA(PR) 6 | 57.269 | 61.892 | 65.419 | 67.791 | 68.937 |
| BETA(PR) 7 | 26.820 | 41.480 | 51.549 | 53.799 | 62.303 |
| V 6 | 334.99 | 345.76 | 352.93 | 364.09 | 388.77 |
| V 7 | 600.11 | 581.96 | 574.27 | 604.00 | 595.53 |
| VZ 6 | 296.34 | 312.17 | 321.28 | 335.53 | 349.70 |
| VZ 7 | 313.81 | 324.59 | 293.87 | 338.64 | 285.37 |
| V-THETA 6 | 155.76 | 147.63 | 144.98 | 140.77 | 169.87 |
| V-THETA 7 | 508.90 | 482.46 | 493.07 | 499.95 | 522.57 |
| V(PR) 6 | 548.2 | 662.8 | 772.6 | 887.8 | 973.0 |
| V(PR) 7 | 356.4 | 434.4 | 473.4 | 573.8 | 614.5 |
| VTHETA PR6 | -461.1 | -584.4 | -702.4 | -821.8 | -908.0 |
| VTHETA PR7 | -160.8 | -287.7 | -370.7 | -463.0 | -544.1 |
| U 6 | 616.81 | 732.07 | 847.34 | 962.60 | 1077.87 |
| U 7 | 669.69 | 770.19 | 863.82 | 963.00 | 1066.66 |
| M 6 | 0.3028 | 0.3127 | 0.3193 | 0.3297 | 0.3525 |
| M 7 | 0.5320 | 0.5139 | 0.5035 | 0.5274 | 0.5171 |
| M(PR) 6 | 0.4955 | 0.5995 | 0.6990 | 0.8038 | 0.8823 |
| M(PR) 7 | 0.3160 | 0.3836 | 0.4150 | 0.5010 | 0.5336 |
| TURN(PR) | 30.429 | 20.374 | 13.836 | 13.977 | 6.634 |
| $\bar{\omega}$ | -0.0259 | 0.0731 | 0.1501 | 0.1505 | 0.1610 |
| DFAC | .5943 | .5475 | .5783 | .5343 | .5377 |
| EFFP | 1.0195 | 1.0567 | 0.9479 | 0.9556 | 0.9233 |
| EFF | 1.0203 | 1.0591 | 0.9456 | 0.9534 | 0.9192 |
| INCIDM | 8.669 | 9.392 | 9.319 | 8.191 | 5.737 |
| DEVM | 8.020 | 8.980 | 9.449 | 5.199 | 9.403 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT. 191 | CRUISE | 6045. | 184. |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.930 | 27.187 | 25.448 | 23.385 | 22.542 |
| V 3 | 289.30 | 303.27 | 312.02 | 317.63 | 319.20 |
| V 4 | 341.17 | 355.75 | 369.00 | 375.17 | 368.00 |
| VZ 3 | 289.30 | 302.86 | 312.01 | 317.62 | 319.19 |
| VZ 4 | 292.62 | 314.90 | 333.15 | 344.34 | 339.89 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 175.36 | 162.54 | 158.56 | 148.91 | 141.08 |
| M 3 | 0.2609 | 0.2737 | 0.2817 | 0.2869 | 0.2883 |
| M 4 | 0.3085 | 0.3219 | 0.3342 | 0.3399 | 0.3333 |
| TURN | -30.93 | -27.19 | -25.45 | -23.38 | -22.54 |
| $\bar{\omega}$ | 0.0656 | | 0.0320 | | 0.0380 |
| DFAC | 0.131 | 0.099 | 0.073 | 0.054 | 0.068 |
| EFFP | 0.8891 | 0.8963 | 0.9185 | 0.9914 | 0.9203 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.070 | 7.113 | 7.052 | 7.515 | 6.458 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 57.769 | 55.428 | 56.600 | 52.729 | 50.107 |
| BETA 10 | 35.647 | 25.554 | 25.773 | 25.959 | 26.802 |
| V 9 | 594.95 | 584.12 | 591.17 | 624.25 | 629.00 |
| V 10 | 199.64 | 372.77 | 437.15 | 494.10 | 539.55 |
| VZ 9 | 311.51 | 329.11 | 324.31 | 377.72 | 403.41 |
| VZ 10 | 159.12 | 333.04 | 391.92 | 443.75 | 481.59 |
| V-THETA 9 | 503.27 | 480.97 | 493.53 | 496.76 | 482.59 |
| V-THETA 10 | 116.35 | 160.80 | 190.08 | 216.28 | 243.29 |
| M 9 | 0.5275 | 0.5162 | 0.5192 | 0.5464 | 0.5486 |
| M 10 | 0.1729 | 0.3248 | 0.3803 | 0.4282 | 0.4670 |
| TURN | 22.122 | 29.874 | 30.826 | 26.770 | 23.305 |
| $\bar{\omega}$ | 0.7139 | 0.3876 | 0.2351 | 0.2187 | 0.1794 |
| DFAC | 0.9074 | 0.5843 | 0.4843 | 0.4175 | 0.3244 |
| EFFP | 0.3097 | 0.4708 | 0.6690 | 0.4767 | 0.3600 |
| INCIDM | 7.869 | 9.328 | 12.900 | 9.729 | 5.107 |
| DEVM | 18.347 | 7.054 | 7.273 | 7.959 | 9.702 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.951 | 25.407 | 24.220 | 22.010 | 21.064 |
| BETA 7 | 56.893 | 56.618 | 58.130 | 54.725 | 52.648 |
| BETA(PR) 6 | 54.354 | 59.592 | 63.250 | 65.809 | 68.900 |
| BETA(PR) 7 | 24.423 | 41.038 | 49.690 | 52.623 | 57.401 |
| V 6 | 362.80 | 372.20 | 381.84 | 394.77 | 388.02 |
| V 7 | 616.84 | 586.15 | 586.99 | 612.46 | 611.74 |
| VZ 6 | 320.39 | 335.92 | 348.14 | 365.97 | 362.09 |
| VZ 7 | 333.73 | 322.15 | 309.74 | 353.63 | 371.14 |
| V-THETA 6 | 170.05 | 159.69 | 156.65 | 147.94 | 139.46 |
| V-THETA 7 | 516.70 | 489.45 | 498.50 | 500.01 | 486.29 |
| V(PR) 6 | 549.8 | 663.8 | 773.5 | 893.1 | 1005.8 |
| V(PR) 7 | 370.0 | 427.6 | 479.1 | 582.6 | 688.9 |
| VTHETA PR6 | -446.8 | -572.4 | -690.7 | -814.7 | -938.4 |
| VTHETA PR7 | -153.0 | -280.7 | -365.3 | -463.0 | -580.4 |
| U 6 | 615.81 | 732.07 | 847.34 | 962.60 | 1077.87 |
| U 7 | 669.69 | 770.19 | 863.82 | 963.00 | 1066.66 |
| M 6 | 0.3285 | 0.3372 | 0.3461 | 0.3581 | 0.3518 |
| M 7 | 0.5481 | 0.5180 | 0.5155 | 0.5357 | 0.5328 |
| M(PR) 6 | 0.4978 | 0.6013 | 0.7011 | 0.8102 | 0.9121 |
| M(PR) 7 | 0.3288 | 0.3779 | 0.4208 | 0.5096 | 0.6000 |
| TURN(PR) | 29.924 | 18.533 | 13.554 | 13.185 | 11.499 |
| $\bar{\omega}$ | -0.0464 | 0.0414 | 0.1023 | 0.1193 | 0.1011 |
| DFAC | .5672 | .5558 | .5992 | .5236 | .4762 |
| EFFP | 1.0127 | 1.0198 | 0.9551 | 0.9607 | 0.9614 |
| EFF | 1.0132 | 1.0206 | 0.9531 | 0.9587 | 0.9593 |
| INCIDM | 5.754 | 7.092 | 7.150 | 6.209 | 5.700 |
| DEVM | 5.623 | 8.538 | 7.590 | 4.023 | 4.501 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

| 100 PERCENT SPEED PT. 192 | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | CRUISE | 6045. | 193.0 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.800 | 27.432 | 25.636 | 23.143 | 22.016 |
| V 3 | 301.61 | 316.93 | 326.99 | 333.52 | 335.78 |
| V 4 | 361.17 | 374.67 | 385.73 | 390.91 | 384.40 |
| VZ 3 | 301.60 | 316.54 | 326.98 | 333.51 | 335.77 |
| VZ 4 | 310.22 | 330.66 | 347.73 | 359.44 | 356.36 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 184.93 | 172.61 | 166.88 | 153.64 | 144.10 |
| M 3 | 0.2722 | 0.2862 | 0.2954 | 0.3015 | 0.3035 |
| M 4 | 0.3270 | 0.3395 | 0.3497 | 0.3545 | 0.3485 |
| TURN | -30.80 | -27.43 | -25.64 | -23.14 | -22.02 |
| $\bar{\omega}$ | 0.0602 | | 0.0289 | | 0.0260 |
| DFAC | 0.117 | 0.094 | 0.077 | 0.059 | 0.070 |
| EFFP | 0.8848 | 0.8967 | 0.9113 | 0.9870 | 0.9197 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.200 | 6.868 | 6.864 | 7.757 | 6.984 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 55.995 | 54.101 | 55.307 | 51.142 | 47.305 |
| BETA 10 | 30.942 | 25.716 | 25.876 | 26.280 | 27.306 |
| V 9 | 609.09 | 597.23 | 606.74 | 633.43 | 642.05 |
| V 10 | 246.37 | 413.29 | 435.31 | 504.79 | 548.98 |
| VZ 9 | 334.04 | 347.38 | 344.05 | 397.06 | 435.37 |
| VZ 10 | 208.09 | 368.50 | 389.88 | 452.10 | 487.81 |
| V-THETA 9 | 504.93 | 483.79 | 498.87 | 493.26 | 471.89 |
| V-THETA 10 | 126.67 | 179.33 | 189.98 | 223.50 | 251.84 |
| M 9 | 0.5411 | 0.5287 | 0.5338 | 0.5556 | 0.5616 |
| M 10 | 0.2138 | 0.3611 | 0.3785 | 0.4381 | 0.4762 |
| TURN | 25.054 | 28.385 | 29.431 | 24.862 | 19.999 |
| $\bar{\omega}$ | 0.5785 | 0.2120 | 0.2295 | 0.1756 | 0.1547 |
| DFAC | 0.8271 | 0.5146 | 0.5045 | 0.4012 | 0.3092 |
| EFFP | 0.4312 | 0.7034 | 0.6845 | 0.5870 | 0.4669 |
| INCIDM | 6.095 | 8.001 | 11.607 | 8.142 | 2.305 |
| DEVM | 13.642 | 7.216 | 7.376 | 8.280 | 10.206 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.938 | 25.677 | 24.261 | 21.729 | 20.310 |
| BETA 7 | 55.556 | 55.441 | 56.706 | 53.230 | 50.117 |
| BETA(PR) 6 | 52.324 | 57.985 | 61.861 | 64.675 | 67.870 |
| BETA(PR) 7 | 22.962 | 39.272 | 47.421 | 51.437 | 55.690 |
| V 6 | 382.57 | 391.93 | 400.60 | 412.59 | 406.26 |
| V 7 | 629.22 | 598.27 | 602.70 | 620.53 | 624.87 |
| VZ 6 | 337.90 | 352.90 | 365.14 | 383.25 | 381.00 |
| VZ 7 | 353.03 | 339.01 | 330.65 | 371.38 | 400.66 |
| V-THETA 6 | 179.24 | 169.82 | 164.61 | 152.75 | 141.01 |
| V-THETA 7 | 518.91 | 492.70 | 503.77 | 497.07 | 479.50 |
| V(PR) 6 | 552.9 | 664.0 | 774.3 | 896.0 | 1011.4 |
| V(PR) 7 | 386.5 | 438.4 | 489.0 | 595.9 | 710.8 |
| VTHETA PR6 | -437.6 | -562.2 | -682.7 | -809.9 | -936.9 |
| VTHETA PR7 | -150.8 | -277.5 | -360.1 | -465.9 | -587.2 |
| U 6 | 616.81 | 732.07 | 847.34 | 962.60 | 1077.87 |
| U 7 | 669.69 | 770.19 | 863.82 | 963.00 | 1066.66 |
| M 6 | 0.3468 | 0.3555 | 0.3636 | 0.3747 | 0.3688 |
| M 7 | 0.5601 | 0.5297 | 0.5303 | 0.5438 | 0.5458 |
| M(PR) 6 | 0.5012 | 0.6022 | 0.7027 | 0.8138 | 0.9182 |
| M(PR) 7 | 0.3441 | 0.3881 | 0.4302 | 0.5222 | 0.6209 |
| TURN(PR) | 29.355 | 18.589 | 14.435 | 13.236 | 12.179 |
| $\bar{\omega}$ | -0.0737 | 0.0082 | 0.0619 | 0.0818 | 0.0784 |
| DFAC | .5356 | .5359 | .5544 | .5065 | .4536 |
| EFFP | 1.0049 | 1.0181 | 0.9594 | 0.9721 | 0.9887 |
| EFF | 1.0051 | 1.0189 | 0.9576 | 0.9707 | 0.9881 |
| INCIDM | 3.724 | 5.385 | 5.761 | 5.075 | 4.670 |
| DEVM | 4.162 | 6.772 | 5.321 | 2.837 | 2.790 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 100 PERCENT SPEED | PT. 193 | CRUISE | 6045. | 205. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.690 | 27.632 | 25.995 | 23.571 | 21.180 |
| V 3 | 323.93 | 341.57 | 352.24 | 357.94 | 358.90 |
| V 4 | 397.61 | 409.33 | 418.45 | 418.38 | 412.32 |
| VZ 3 | 323.92 | 341.19 | 352.23 | 357.93 | 358.89 |
| VZ 4 | 341.92 | 360.61 | 376.09 | 383.45 | 384.47 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 202.94 | 189.84 | 183.40 | 167.30 | 148.97 |
| M 3 | 0.2926 | 0.3089 | 0.3187 | 0.3240 | 0.3249 |
| M 4 | 0.3608 | 0.3717 | 0.3802 | 0.3801 | 0.3745 |
| TURN | -30.69 | -27.63 | -26.00 | -23.57 | -21.18 |
| $\bar{\omega}$ | 0.0634 | | 0.0299 | | 0.0390 |
| DFAC | 0.094 | 0.083 | 0.074 | 0.066 | 0.058 |
| EFFP | 0.9302 | 0.9180 | 0.9372 | 0.9356 | 0.9064 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.310 | 6.668 | 6.505 | 7.329 | 7.820 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 52.180 | 49.590 | 52.020 | 48.220 | 43.884 |
| BETA 10 | 27.948 | 27.129 | 27.025 | 25.991 | 28.260 |
| V 9 | 648.83 | 629.42 | 633.24 | 645.58 | 654.99 |
| V 10 | 390.48 | 446.54 | 452.50 | 516.61 | 555.35 |
| VZ 9 | 390.36 | 405.09 | 388.73 | 432.03 | 472.02 |
| VZ 10 | 341.57 | 393.96 | 401.91 | 464.21 | 489.08 |
| V-THETA 9 | 512.53 | 479.25 | 499.14 | 481.41 | 454.04 |
| V-THETA 10 | 183.01 | 203.62 | 205.61 | 226.39 | 262.94 |
| M 9 | 0.5791 | 0.5603 | 0.5597 | 0.5691 | 0.5758 |
| M 10 | 0.3413 | 0.3916 | 0.3943 | 0.4504 | 0.4838 |
| TURN | 24.232 | 22.461 | 24.995 | 22.229 | 15.624 |
| $\bar{\omega}$ | 0.2915 | 0.1615 | 0.2196 | 0.1214 | 0.1346 |
| DFAC | 0.5856 | 0.4674 | 0.4873 | 0.3836 | 0.2922 |
| EFFP | 0.6554 | 0.7445 | 0.6506 | 0.7139 | 0.6848 |
| INCIDM | 2.280 | 3.490 | 8.320 | 5.220 | -1.116 |
| DEVM | 10.648 | 8.629 | 8.525 | 7.991 | 11.160 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.880 | 25.541 | 24.392 | 22.016 | 20.167 |
| BETA 7 | 53.064 | 50.978 | 53.452 | 50.319 | 45.664 |
| BETA(PR) 6 | 48.544 | 54.474 | 59.075 | 62.746 | 66.599 |
| BETA(PR) 7 | 19.578 | 35.539 | 43.970 | 49.838 | 53.443 |
| V 6 | 420.16 | 432.17 | 438.37 | 442.68 | 429.77 |
| V 7 | 661.08 | 627.88 | 626.95 | 630.97 | 643.43 |
| VZ 6 | 371.31 | 389.65 | 399.17 | 410.37 | 402.49 |
| VZ 7 | 394.81 | 394.97 | 373.16 | 402.81 | 449.66 |
| V-THETA 6 | 196.47 | 186.33 | 181.03 | 165.95 | 147.82 |
| V-THETA 7 | 528.41 | 487.80 | 503.67 | 485.60 | 460.22 |
| V(PR) 6 | 560.9 | 670.7 | 776.8 | 896.1 | 1013.4 |
| V(PR) 7 | 421.6 | 485.8 | 518.7 | 624.7 | 755.0 |
| VTHETA PR6 | -420.3 | -545.7 | -666.3 | -796.7 | -930.0 |
| VTHETA PR7 | -141.3 | -232.4 | -360.2 | -477.4 | -606.4 |
| U 6 | 616.81 | 732.07 | 847.34 | 962.60 | 1077.87 |
| U 7 | 669.69 | 770.19 | 863.82 | 963.00 | 1066.66 |
| M 6 | 0.3819 | 0.3931 | 0.3989 | 0.4029 | 0.3899 |
| M 7 | 0.5909 | 0.5588 | 0.5541 | 0.5556 | 0.5651 |
| M(PR) 6 | 0.5097 | 0.6100 | 1.7068 | 0.8156 | 0.9214 |
| M(PR) 7 | 0.3768 | 0.4324 | 0.4585 | 0.5501 | 0.6631 |
| TURN(PR) | 28.960 | 18.915 | 15.100 | 12.907 | 13.156 |
| $\bar{\omega}$ | -0.0613 | -0.0000 | 0.0368 | 0.0523 | 0.0584 |
| DFAC | .4755 | .4577 | .5088 | .4621 | .3989 |
| EFFP | 0.9775 | 1.0446 | 0.9627 | 0.9796 | 1.0081 |
| EFF | 0.9767 | 1.0463 | 0.9612 | 0.9787 | 1.0085 |
| INCIDM | -0.056 | 1.974 | 2.975 | 3.146 | 3.399 |
| DEVM | 0.778 | 3.039 | 1.870 | 1.238 | 0.543 |

## Table B-3. Blade Element Data Cruise Configuration (Continued)

100 PERCENT SPEED PT. 194 — CONFIGURATION: CRUISE — $N/\sqrt{\theta}$: 6045. — $\omega\sqrt{\theta}/\delta$: 217.4

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.906 | 27.735 | 25.894 | 23.330 | 19.050 |
| V 3 | 343.80 | 362.34 | 374.14 | 380.67 | 381.33 |
| V 4 | 429.29 | 437.21 | 445.15 | 443.64 | 433.28 |
| VZ 3 | 343.78 | 361.98 | 374.13 | 380.65 | 381.32 |
| VZ 4 | 368.33 | 384.79 | 400.44 | 407.36 | 409.55 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 220.50 | 203.47 | 194.40 | 175.69 | 141.42 |
| M 3 | 0.3109 | 0.3280 | 0.3390 | 0.3450 | 0.3456 |
| M 4 | 0.3904 | 0.3978 | 0.4052 | 0.4038 | 0.3941 |
| TURN | -30.91 | -27.74 | -25.89 | -23.33 | -19.05 |
| $\bar{\omega}$ | 0.0613 | | 0.0294 | | 0.0350 |
| DFAC | 0.080 | 0.078 | 0.072 | 0.066 | 0.049 |
| EFFP | 0.9511 | 0.9328 | 0.9647 | 0.9919 | 0.8982 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.093 | 6.565 | 6.606 | 7.570 | 9.950 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 47.578 | 47.098 | 48.608 | 44.056 | 40.523 |
| BETA 10 | 28.075 | 28.125 | 27.622 | 26.006 | 27.323 |
| V 9 | 667.99 | 642.00 | 636.57 | 652.77 | 647.71 |
| V 10 | 502.34 | 496.85 | 501.68 | 542.07 | 578.47 |
| VZ 9 | 442.54 | 433.87 | 419.88 | 469.04 | 492.23 |
| VZ 10 | 440.06 | 434.54 | 443.32 | 487.08 | 513.81 |
| V-THETA 9 | 493.11 | 470.28 | 477.56 | 453.91 | 420.85 |
| V-THETA 10 | 236.41 | 234.22 | 232.59 | 237.68 | 265.53 |
| M 9 | 0.5997 | 0.5737 | 0.5654 | 0.5789 | 0.5720 |
| M 10 | 0.4441 | 0.4384 | 0.4404 | 0.4760 | 0.5078 |
| TURN | 19.503 | 18.973 | 20.987 | 18.050 | 13.200 |
| $\bar{\omega}$ | 0.1641 | 0.1562 | 0.1783 | 0.1579 | 0.1374 |
| DFAC | 0.3874 | 0.3738 | 0.3791 | 0.3237 | 0.2223 |
| EFFP | 0.7391 | 0.7066 | 0.6203 | 0.5679 | 0.6573 |
| INCIDM | -2.322 | 0.998 | 4.908 | 1.056 | -4.477 |
| DEVM | 10.775 | 9.625 | 9.122 | 8.006 | 10.223 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.941 | 25.595 | 24.275 | 21.672 | 17.848 |
| BETA 7 | 48.972 | 48.463 | 50.074 | 45.942 | 40.761 |
| BETA(PR) 6 | 45.029 | 51.989 | 56.995 | 60.928 | 65.603 |
| BETA(PR) 7 | 20.002 | 34.655 | 43.482 | 48.721 | 53.296 |
| V 6 | 455.98 | 461.85 | 467.02 | 471.68 | 448.14 |
| V 7 | 674.19 | 638.15 | 627.99 | 637.42 | 639.12 |
| VZ 6 | 402.75 | 416.24 | 425.66 | 438.32 | 426.57 |
| VZ 7 | 440.23 | 422.82 | 402.87 | 443.18 | 484.08 |
| V-THETA 6 | 213.65 | 199.52 | 192.00 | 174.19 | 137.35 |
| V-THETA 7 | 508.60 | 477.67 | 481.59 | 458.07 | 417.29 |
| V(PR) 6 | 569.9 | 676.1 | 781.5 | 902.1 | 1032.7 |
| V(PR) 7 | 471.0 | 514.4 | 555.5 | 671.9 | 810.0 |
| VTHETA PR6 | -403.2 | -532.5 | -655.3 | -788.4 | -940.5 |
| VTHETA PR7 | -161.1 | -292.5 | -382.2 | -504.9 | -649.4 |
| U 6 | 616.81 | 732.07 | 847.34 | 962.60 | 1077.87 |
| U 7 | 669.69 | 770.19 | 863.82 | 963.00 | 1066.66 |
| M 6 | 0.4154 | 0.4210 | 0.4259 | 0.4303 | 0.4080 |
| M 7 | 0.6057 | 0.5701 | 0.5575 | 0.5647 | 0.5641 |
| M(PR) 6 | 0.5192 | 0.6162 | 0.7126 | 0.8228 | 0.9403 |
| M(PR) 7 | 0.4231 | 0.4596 | 0.4931 | 0.5952 | 0.7149 |
| TURN(PR) | 25.021 | 17.315 | 13.509 | 12.206 | 12.307 |
| $\bar{\omega}$ | -0.0689 | 0.0135 | 0.0445 | 0.0567 | 0.0919 |
| DFAC | .3742 | .4065 | .3970 | .4296 | .3422 |
| EFFP | 0.9844 | 1.0095 | 0.9445 | 0.9973 | 1.0083 |
| EFF | 0.9839 | 1.0098 | 0.9425 | 0.9972 | 1.0087 |
| INCIDM | -3.571 | -0.511 | 0.895 | 1.328 | 2.403 |
| DEVM | 1.202 | 2.155 | 1.382 | 0.121 | 0.396 |

# Table B-3. Blade Element Data Cruise Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 100PERCENT SPEED | PT.189 | CRUISE | 6055. | 232.5 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 30.687 | 27.709 | 26.007 | 23.428 | 19.704 |
| V 3 | 370.78 | 391.33 | 404.25 | 411.12 | 412.31 |
| V 4 | 465.50 | 476.56 | 482.51 | 482.42 | 473.06 |
| VZ 3 | 370.75 | 390.92 | 404.23 | 411.10 | 412.29 |
| VZ 4 | 400.31 | 419.59 | 433.63 | 442.63 | 445.36 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 237.57 | 221.59 | 211.57 | 191.81 | 159.50 |
| M 3 | 0.3359 | 0.3549 | 0.3670 | 0.3734 | 0.3745 |
| M 4 | 0.4244 | 0.4349 | 0.4405 | 0.4404 | 0.4316 |
| TURN | -30.69 | -27.71 | -26.01 | -23.43 | -19.70 |
| $\bar{\omega}$ | 0.0549 | | 0.0230 | | 0.0320 |
| DFAC | 0.073 | 0.069 | 0.070 | 0.061 | 0.046 |
| EFFP | 0.9021 | 0.8948 | 0.9049 | 0.9616 | 0.8298 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.313 | 6.591 | 6.493 | 7.472 | 9.296 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 41.783 | 41.337 | 41.751 | 39.515 | 31.108 |
| BETA 10 | 28.417 | 28.667 | 27.851 | 25.906 | 28.591 |
| V 9 | 685.92 | 652.94 | 645.07 | 639.83 | 645.02 |
| V 10 | 613.98 | 604.97 | 593.75 | 612.97 | 636.40 |
| VZ 9 | 502.64 | 486.86 | 480.25 | 493.53 | 552.12 |
| VZ 10 | 536.57 | 526.78 | 523.81 | 551.28 | 558.68 |
| V-THETA 9 | 457.03 | 431.26 | 429.55 | 407.11 | 333.25 |
| V-THETA 10 | 292.18 | 290.21 | 277.39 | 267.80 | 304.55 |
| M 9 | 0.6205 | 0.5882 | 0.5786 | 0.5722 | 0.5746 |
| M 10 | 0.5512 | 0.5424 | 0.5299 | 0.5468 | 0.5659 |
| TURN | 13.366 | 12.670 | 13.900 | 13.609 | 2.517 |
| $\bar{\omega}$ | 0.2422 | 0.1591 | 0.1957 | 0.1351 | 0.1260 |
| DFAC | 0.1885 | 0.1583 | 0.1810 | 0.1433 | 0.0361 |
| EFFP | 0.0376 | 0.0325 | -0.1113 | -0.4927 | -0.8383 |
| INCIDM | -8.117 | -4.763 | -1.949 | -3.485 | -13.892 |
| DEVM | 11.117 | 10.167 | 9.351 | 7.906 | 11.491 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 27.653 | 25.450 | 24.218 | 21.962 | 18.406 |
| BETA 7 | 43.384 | 43.011 | 43.180 | 41.269 | 37.310 |
| BETA(PR) 6 | 41.504 | 48.547 | 54.091 | 58.647 | 63.178 |
| BETA(PR) 7 | 21.753 | 35.331 | 43.086 | 49.834 | 52.986 |
| V 6 | 495.16 | 505.26 | 508.40 | 508.52 | 492.46 |
| V 7 | 686.68 | 642.64 | 633.26 | 622.28 | 643.20 |
| VZ 6 | 438.50 | 455.91 | 463.57 | 471.58 | 467.27 |
| VZ 7 | 496.59 | 469.49 | 461.54 | 467.63 | 511.56 |
| V-THETA 6 | 229.81 | 217.12 | 208.55 | 190.18 | 155.49 |
| V-THETA 7 | 471.67 | 438.37 | 433.33 | 410.45 | 389.86 |
| V(PR) 6 | 585.6 | 688.9 | 790.5 | 906.4 | 1035.6 |
| V(PR) 7 | 537.3 | 576.0 | 632.3 | 725.1 | 849.8 |
| VTHETA PR6 | -388.0 | -516.2 | -640.2 | -774.0 | -924.2 |
| VTHETA PR7 | -199.1 | -333.1 | -431.9 | -554.1 | -678.6 |
| U 6 | 617.83 | 733.28 | 848.74 | 964.19 | 1079.65 |
| U 7 | 670.80 | 771.46 | 865.25 | 964.59 | 1068.42 |
| M 6 | 0.4525 | 0.4621 | 0.4652 | 0.4653 | 0.4500 |
| M 7 | 0.6212 | 0.5784 | 0.5675 | 0.5557 | 0.5722 |
| M(PR) 6 | 0.5352 | 0.6301 | 0.7232 | 0.8293 | 0.9462 |
| M(PR) 7 | 0.4861 | 0.5184 | 0.5666 | 0.6476 | 0.7560 |
| TURN(PR) | 19.746 | 13.197 | 10.999 | 8.812 | 10.192 |
| $\bar{\omega}$ | 0.0232 | 0.0838 | 0.0679 | 0.0575 | 0.0578 |
| DFAC | .2453 | .2960 | .3219 | .3085 | .2849 |
| EFFP | 1.0492 | 1.0578 | 1.0238 | 1.0111 | 0.9643 |
| EFF | 1.0506 | 1.0595 | 1.0246 | 1.0115 | 0.9630 |
| INCIDM | -7.096 | -3.953 | -2.009 | -0.953 | -0.022 |
| DEVM | 2.953 | 2.831 | 0.986 | 1.234 | 0.086 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50 PERCENT SPEED PT. 215 | INTERMEDIATE | 3020. | 89.71 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.052 | 14.771 | 13.883 | 10.292 | 7.446 |
| V 3 | 135.77 | 142.77 | 146.86 | 149.55 | 150.34 |
| V 4 | 140.12 | 152.54 | 158.51 | 163.06 | 160.34 |
| VZ 3 | 135.77 | 142.53 | 146.86 | 149.55 | 150.33 |
| VZ 4 | 135.29 | 146.84 | 153.85 | 160.43 | 158.99 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 36.39 | 38.89 | 38.03 | 29.13 | 20.76 |
| M 3 | 0.1218 | 0.1281 | 0.1318 | 0.1342 | 0.1349 |
| M 4 | 0.1257 | 0.1369 | 0.1423 | 0.1464 | 0.1439 |
| TURN | -15.05 | -14.77 | -13.86 | -10.29 | -7.45 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.106 | 0.070 | 0.051 | 0.008 | 0.003 |
| EFFP | 0.8572 | 1.0482 | 0.8412 | 0.9662 | 0.7647 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.648 | 4.229 | 3.317 | 5.308 | 7.854 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 52.366 | 53.407 | 54.159 | 49.489 | 45.857 |
| BETA 10 | 21.572 | 18.535 | 15.440 | 14.703 | 11.737 |
| V 9 | 299.70 | 279.36 | 276.74 | 292.72 | 293.52 |
| V 10 | 151.84 | 185.60 | 183.52 | 235.36 | 250.54 |
| VZ 9 | 160.36 | 165.51 | 161.56 | 189.99 | 204.42 |
| VZ 10 | 139.28 | 174.63 | 176.25 | 227.43 | 245.30 |
| V-THETA 9 | 237.34 | 224.29 | 224.34 | 222.55 | 210.63 |
| V-THETA 10 | 55.85 | 59.02 | 48.86 | 59.74 | 50.97 |
| M 9 | 0.2674 | 0.2489 | 0.2462 | 0.2600 | 0.2605 |
| M 10 | 0.1348 | 0.1649 | 0.1628 | 0.2087 | 0.2219 |
| TURN | 30.794 | 34.872 | 38.716 | 34.736 | 34.120 |
| $\bar{\omega}$ | 0.3605 | 0.1866 | 0.2603 | 0.1306 | 0.1152 |
| DFAC | 0.7204 | 0.5780 | 0.6159 | 0.4552 | 0.4120 |
| EFFP | 0.4961 | 0.6356 | 0.5159 | 0.6027 | 0.4698 |
| INCIDM | 6.966 | 11.807 | 14.959 | 10.989 | 5.357 |
| DEVM | 17.227 | 13.023 | 9.940 | 9.703 | 7.637 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 13.502 | 13.764 | 13.216 | 9.699 | 6.830 |
| BETA 7 | 52.735 | 54.316 | 55.432 | 51.362 | 48.257 |
| BETA(PR) 6 | 61.691 | 64.466 | 67.552 | 69.558 | 72.049 |
| BETA(PR) 7 | 25.727 | 43.810 | 52.743 | 55.167 | 59.448 |
| V 6 | 151.20 | 161.19 | 163.81 | 170.97 | 169.14 |
| V 7 | 307.62 | 280.48 | 274.98 | 286.65 | 284.35 |
| VZ 6 | 146.97 | 156.40 | 159.42 | 168.51 | 167.94 |
| VZ 7 | 184.97 | 163.39 | 155.90 | 178.94 | 189.31 |
| V-THETA 6 | 35.30 | 38.35 | 37.45 | 28.80 | 20.11 |
| V-THETA 7 | 244.82 | 227.82 | 226.43 | 223.90 | 212.16 |
| V(PR) 6 | 309.9 | 362.9 | 417.5 | 482.5 | 544.9 |
| V(PR) 7 | 206.8 | 226.7 | 257.7 | 313.3 | 372.4 |
| VTHETA PR6 | -272.8 | -327.4 | -385.9 | -452.1 | -518.4 |
| VTHETA PR7 | -89.8 | -157.0 | -205.1 | -257.2 | -320.7 |
| U 6 | 308.15 | 365.73 | 423.32 | 480.90 | 538.49 |
| U 7 | 334.57 | 384.78 | 431.55 | 481.10 | 532.89 |
| M 6 | 0.1357 | 0.1447 | 0.1471 | 0.1535 | 0.1519 |
| M 7 | 0.2745 | 0.2499 | 0.2446 | 0.2546 | 0.2522 |
| M(PR) 6 | 0.2781 | 0.3257 | 0.3748 | 0.4332 | 0.4892 |
| M(PR) 7 | 0.1845 | 0.2020 | 0.2292 | 0.2783 | 0.3304 |
| TURN(PR) | 35.955 | 20.633 | 14.802 | 14.389 | 12.602 |
| $\bar{\omega}$ | 0.1229 | 0.2067 | 0.2780 | 0.2199 | 0.2665 |
| DFAC | .5839 | .5828 | .5739 | .5312 | .4818 |
| EFFP | 1.0038 | 0.9792 | 0.9283 | 0.9031 | 0.8774 |
| EFF | 1.0038 | 0.9790 | 0.9274 | 0.9018 | 0.8757 |
| INCIDM | 13.019 | 11.966 | 11.422 | 9.958 | 8.849 |
| DEVM | 6.927 | 11.310 | 10.643 | 6.567 | 6.588 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 50PERCENT SPEED | PT.216 | CONFIGURATION INTERMEDIATE | $N/\sqrt{\theta}$ 3027. | $w\sqrt{\theta}/\delta$ 27.2 |
|---|---|---|---|---|

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.387 | 14.925 | 13.648 | 9.762 | 6.804 |
| V 3 | 147.69 | 154.82 | 159.53 | 162.35 | 162.70 |
| V 4 | 163.71 | 164.55 | 169.63 | 174.47 | 173.55 |
| VZ 3 | 147.68 | 154.68 | 159.53 | 162.34 | 162.69 |
| VZ 4 | 157.84 | 158.11 | 165.03 | 171.93 | 172.33 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 43.44 | 42.36 | 40.07 | 29.58 | 20.56 |
| M 3 | 0.1325 | 0.1390 | 0.1432 | 0.1457 | 0.1460 |
| M 4 | 0.1470 | 0.1477 | 0.1525 | 0.1567 | 0.1558 |
| TURN | -15.39 | -14.93 | -13.65 | -9.76 | -6.80 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.042 | 0.076 | 0.062 | 0.017 | -0.004 |
| EFFP | 4.3323 | 0.9059 | 0.7536 | 0.8476 | 0.7223 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.313 | 4.075 | 3.552 | 5.838 | 8.496 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 51.209 | 51.492 | 49.155 | 45.708 | 44.537 |
| BETA 10 | 22.584 | 17.216 | 15.137 | 14.820 | 9.562 |
| V 9 | 312.79 | 292.95 | 290.55 | 305.20 | 304.75 |
| V 10 | 182.73 | 207.39 | 206.21 | 238.12 | 266.30 |
| VZ 9 | 192.34 | 181.05 | 189.52 | 213.07 | 217.20 |
| VZ 10 | 167.11 | 196.34 | 198.43 | 230.11 | 262.57 |
| V-THETA 9 | 243.80 | 229.24 | 219.80 | 218.46 | 213.74 |
| V-THETA 10 | 70.18 | 61.38 | 53.85 | 60.91 | 44.24 |
| M 9 | 0.2792 | 0.2611 | 0.2587 | 0.2714 | 0.2705 |
| M 10 | 0.1623 | 0.1842 | 0.1830 | 0.2112 | 0.2360 |
| TURN | 28.624 | 34.276 | 34.018 | 30.887 | 34.976 |
| $\bar{\omega}$ | 0.2858 | 0.1323 | 0.1976 | 0.1623 | 0.0715 |
| DFAC | 0.6229 | 0.5270 | 0.5415 | 0.4604 | 0.3976 |
| EFFP | 0.6030 | 0.7519 | 0.6155 | 0.6276 | 0.7923 |
| INCIDM | 5.809 | 9.892 | 9.955 | 7.208 | 4.037 |
| DEVM | 18.248 | 11.761 | 9.637 | 9.820 | 5.462 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 13.976 | 13.902 | 12.718 | 9.991 | 6.358 |
| BETA 7 | 51.646 | 52.785 | 50.687 | 47.303 | 45.789 |
| BETA(PR) 6 | 57.601 | 62.615 | 65.678 | 68.051 | 70.085 |
| BETA(PR) 7 | 22.597 | 40.661 | 49.152 | 52.412 | 57.012 |
| V 6 | 174.47 | 173.52 | 178.44 | 184.91 | 190.24 |
| V 7 | 321.69 | 293.09 | 297.14 | 298.42 | 298.22 |
| VZ 6 | 169.27 | 169.39 | 174.02 | 182.43 | 170.12 |
| VZ 7 | 198.43 | 177.11 | 191.92 | 202.33 | 207.95 |
| V-THETA 6 | 42.14 | 41.69 | 30.29 | 29.22 | 19.96 |
| V-THETA 7 | 252.27 | 233.41 | 222.16 | 219.33 | 213.75 |
| V(PR) 6 | 315.9 | 366.0 | 422.5 | 485.2 | 549.8 |
| V(PR) 7 | 216.2 | 233.7 | 278.1 | 331.8 | 391.2 |
| VTHETA PR6 | -266.7 | -324.9 | -395.0 | -452.8 | -519.8 |
| VTHETA PR7 | -83.1 | -152.3 | -210.4 | -262.9 | -320.4 |
| U 6 | 308.86 | 366.58 | 424.30 | 482.02 | 539.74 |
| U 7 | 335.35 | 385.67 | 432.55 | 482.22 | 534.12 |
| M 6 | 0.1567 | 0.1558 | 0.1602 | 0.1669 | 0.1619 |
| M 7 | 0.2873 | 0.2612 | 0.2557 | 0.2653 | 0.2646 |
| M(PR) 6 | 0.2837 | 0.3286 | 0.3705 | 0.4335 | 0.4937 |
| M(PR) 7 | 0.1931 | 0.2083 | 0.2475 | 0.2950 | 0.3389 |
| TURN(PR) | 34.998 | 21.934 | 16.522 | 15.638 | 13.072 |
| $\bar{\omega}$ | 0.1252 | 0.1652 | 0.1897 | 0.1587 | 0.1919 |
| DFAC | .5634 | .5698 | .5246 | .4942 | .4706 |
| EFFP | 0.9074 | 0.9122 | 0.9183 | 0.8834 | 0.8394 |
| EFF | 0.9065 | 0.9190 | 0.9174 | 0.8880 | 0.8372 |
| INCIDM | 9.001 | 10.115 | 9.576 | 8.451 | 7.785 |
| DEVM | 3.797 | 8.161 | 7.052 | 3.812 | 4.113 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 50PERCENT SPEED PT.217 | INTERMEDIATE | 3037. | 113.0 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.814 | 14.632 | 13.608 | 9.668 | 6.965 |
| V 3 | 170.63 | 180.48 | 186.54 | 189.77 | 190.13 |
| V 4 | 182.40 | 196.28 | 200.96 | 205.25 | 201.09 |
| VZ 3 | 170.62 | 180.25 | 186.53 | 189.76 | 190.12 |
| VZ 4 | 175.49 | 188.84 | 195.31 | 202.33 | 199.61 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 49.71 | 49.58 | 47.26 | 34.47 | 24.39 |
| M 3 | 0.1532 | 0.1621 | 0.1676 | 0.1705 | 0.1708 |
| M 4 | 0.1636 | 0.1764 | 0.1806 | 0.1845 | 0.1807 |
| TURN | -15.81 | -14.63 | -13.61 | -9.67 | -6.96 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.081 | 0.052 | 0.050 | 0.010 | 0.006 |
| EFFP | 0.7971 | 1.0127 | 0.8173 | 0.9329 | 0.6683 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.886 | 4.368 | 3.592 | 5.912 | 8.335 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 45.216 | 42.880 | 41.437 | 38.393 | 37.163 |
| BETA 10 | 17.642 | 15.060 | 14.080 | 13.932 | 11.970 |
| V 9 | 325.61 | 306.08 | 303.04 | 306.72 | 306.80 |
| V 10 | 243.22 | 244.42 | 249.86 | 270.14 | 235.72 |
| VZ 9 | 225.51 | 222.69 | 226.65 | 240.34 | 244.52 |
| VZ 10 | 229.98 | 234.14 | 241.75 | 262.06 | 279.48 |
| V-THETA 9 | 231.12 | 208.28 | 200.55 | 190.49 | 185.37 |
| V-THETA 10 | 73.71 | 63.51 | 60.79 | 65.27 | 59.26 |
| M 9 | 0.2911 | 0.2734 | 0.2704 | 0.2734 | 0.2731 |
| M 10 | 0.2166 | 0.2178 | 0.2225 | 0.2404 | 0.2541 |
| TURN | 27.576 | 27.820 | 27.356 | 24.412 | 25.193 |
| $\bar{\omega}$ | 0.1375 | 0.0844 | 0.0843 | 0.2490 | -0.0076 |
| DFAC | 0.4329 | 0.3951 | 0.3781 | 0.3096 | 0.2698 |
| EFFP | 0.7115 | 0.7642 | 0.7484 | 0.9252 | 1.2011 |
| INCIDM | -0.182 | 1.280 | 2.237 | -0.107 | -3.337 |
| DEVM | 13.342 | 9.560 | 8.580 | 8.982 | 7.870 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.333 | 13.525 | 12.586 | 9.030 | 6.623 |
| BETA 7 | 46.468 | 44.236 | 42.983 | 39.809 | 38.140 |
| BETA(PR) 6 | 54.260 | 57.605 | 61.451 | 64.580 | 68.189 |
| BETA(PR) 7 | 22.894 | 38.733 | 46.615 | 51.777 | 56.118 |
| V 6 | 194.46 | 208.41 | 211.65 | 216.39 | 208.48 |
| V 7 | 331.21 | 304.13 | 298.11 | 299.46 | 299.57 |
| VZ 6 | 188.36 | 202.44 | 206.52 | 213.70 | 207.09 |
| VZ 7 | 226.96 | 217.68 | 217.96 | 230.00 | 235.51 |
| V-THETA 6 | 48.14 | 48.74 | 46.12 | 33.96 | 24.05 |
| V-THETA 7 | 240.12 | 212.17 | 203.25 | 191.72 | 185.01 |
| V(PR) 6 | 322.5 | 378.0 | 432.1 | 497.9 | 557.4 |
| V(PR) 7 | 247.6 | 279.3 | 317.5 | 371.8 | 422.6 |
| VTHETA PR6 | -261.7 | -319.1 | -379.6 | -449.6 | -517.5 |
| VTHETA PR7 | -96.3 | -174.8 | -230.7 | -292.1 | -350.9 |
| U 6 | 309.88 | 367.79 | 425.70 | 483.61 | 541.52 |
| U 7 | 336.45 | 386.94 | 433.98 | 483.81 | 535.89 |
| M 6 | 0.1747 | 0.1873 | 0.1903 | 0.1946 | 0.1874 |
| M 7 | 0.2962 | 0.2717 | 0.2660 | 0.2669 | 0.2666 |
| M(PR) 6 | 0.2898 | 0.3397 | 0.3885 | 0.4476 | 0.5010 |
| M(PR) 7 | 0.2214 | 0.2495 | 0.2833 | 0.3314 | 0.3761 |
| TURN(PR) | 31.359 | 18.848 | 14.831 | 12.801 | 12.071 |
| $\bar{\omega}$ | 0.0714 | 0.0867 | 0.0838 | 0.0999 | 0.1051 |
| DFAC | .4547 | .4337 | .4191 | .3947 | .3820 |
| EFFP | 0.9587 | 0.9995 | 0.9886 | 0.9492 | 0.8990 |
| EFF | 0.9582 | 0.9995 | 0.9885 | 0.9487 | 0.8978 |
| INCIDM | 5.660 | 5.105 | 5.351 | 4.980 | 4.989 |
| DEVM | 4.094 | 6.233 | 4.515 | 3.177 | 3.288 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| SUPERCENT SPEED PT.218 | INTERMEDIATE | 2974. | 121.6 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | [illegible] | 14.574 | 13.271 | 9.392 | 5.623 |
| V 3 | 183.62 | 194.31 | 201.02 | 204.59 | 204.99 |
| V 4 | 197.99 | 212.30 | 216.77 | 220.40 | 215.55 |
| VZ 3 | 183.60 | 194.08 | 201.01 | 204.56 | 204.98 |
| VZ 4 | 190.43 | 204.28 | 210.98 | 217.44 | 214.12 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 54.19 | 53.42 | 49.76 | 35.97 | 24.86 |
| M 3 | 0.1649 | 0.1746 | 0.1807 | 0.1839 | 0.1842 |
| M 4 | 0.1779 | 0.1909 | 0.1949 | 0.1982 | 0.1938 |
| TURN | -15.88 | -14.57 | -13.27 | -9.39 | -6.62 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.073 | 0.047 | 0.046 | 0.011 | 0.009 |
| EFFP | 0.8256 | 1.0062 | 0.8453 | 0.9535 | 0.6592 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.817 | 4.426 | 3.929 | 6.208 | 8.677 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 39.183 | 37.893 | 35.775 | 32.703 | 30.404 |
| BETA 10 | 15.981 | 14.420 | 13.874 | 13.605 | 13.385 |
| V 9 | 329.49 | 309.32 | 304.99 | 306.42 | 303.88 |
| V 10 | 284.35 | 274.09 | 273.43 | 284.54 | 297.13 |
| VZ 9 | 251.21 | 242.36 | 246.88 | 257.79 | 252.06 |
| VZ 10 | 271.68 | 263.42 | 264.84 | 276.50 | 289.01 |
| V-THETA 9 | 208.17 | 189.98 | 178.30 | 165.55 | 153.79 |
| V-THETA 10 | 78.29 | 68.28 | 65.50 | 66.93 | 68.78 |
| M 9 | 0.2951 | 0.2768 | 0.2727 | 0.2738 | 0.2712 |
| M 10 | 0.2541 | 0.2449 | 0.2442 | 0.2540 | 0.2651 |
| TURN | 23.202 | 23.467 | 21.901 | 19.098 | 17.019 |
| $\bar{\omega}$ | 0.0965 | 0.0850 | 0.1057 | 0.0944 | 0.0722 |
| DFAC | 0.2827 | 0.2746 | 0.2656 | 0.2215 | 0.1593 |
| EFFP | 0.6407 | 0.5829 | 0.4180 | 0.3202 | -0.0330 |
| INCIDM | -6.217 | -3.707 | -3.425 | -5.797 | -10.096 |
| DEVM | 11.681 | 8.926 | 8.374 | 8.605 | 9.285 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.365 | 13.479 | 12.237 | 8.806 | 6.129 |
| BETA 7 | 40.611 | 39.381 | 37.241 | 33.882 | 31.688 |
| BETA(PR) 6 | 50.777 | 54.528 | 58.769 | 62.352 | 66.357 |
| BETA(PR) 7 | 24.003 | 38.118 | 45.656 | 51.096 | 55.451 |
| V 6 | 211.52 | 225.58 | 228.63 | 232.22 | 223.00 |
| V 7 | 333.13 | 305.35 | 299.35 | 298.68 | 297.97 |
| VZ 6 | 204.86 | 219.17 | 223.39 | 229.47 | 221.72 |
| VZ 7 | 251.74 | 235.80 | 238.19 | 247.92 | 253.55 |
| V-THETA 6 | 52.48 | 52.58 | 48.46 | 35.55 | 23.81 |
| V-THETA 7 | 216.84 | 193.73 | 181.15 | 166.51 | 156.52 |
| V(PR) 6 | 324.0 | 377.8 | 430.9 | 494.5 | 552.9 |
| V(PR) 7 | 276.8 | 300.0 | 340.9 | 394.8 | 447.1 |
| VTHETA PR6 | -251.0 | -307.6 | -368.4 | -438.0 | -506.5 |
| VTHETA PR7 | -112.6 | -185.2 | -243.8 | -307.3 | -368.2 |
| U 6 | 303.46 | 360.16 | 416.87 | 473.58 | 530.29 |
| U 7 | 329.47 | 378.91 | 424.98 | 473.77 | 524.77 |
| M 6 | 0.1902 | 0.2029 | 0.2057 | 0.2089 | 0.2006 |
| M 7 | 0.2984 | 0.2732 | 0.2676 | 0.2668 | 0.2658 |
| M(PR) 6 | 0.2913 | 0.3398 | 0.3876 | 0.4449 | 0.4972 |
| M(PR) 7 | 0.2480 | 0.2684 | 0.3048 | 0.3527 | 0.3989 |
| TURN(PR) | 26.763 | 16.386 | 13.108 | 11.254 | 10.906 |
| $\bar{\omega}$ | 0.0360 | 0.0354 | 0.0346 | 0.0659 | 0.0869 |
| DFAC | .3364 | .3556 | .3393 | .3199 | .3038 |
| EFFP | 1.0491 | 1.0650 | 1.0782 | 1.0410 | 0.9938 |
| EFF | 1.0496 | 1.0656 | 1.0790 | 1.0414 | 0.9938 |
| INCIDM | 2.177 | 2.208 | 2.669 | 2.752 | 3.157 |
| DEVM | 5.208 | 5.618 | 3.556 | 2.496 | 2.551 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 50PERCENT SPEED | PT.214 | CONFIGURATION INTERMEDIATE | $N/\sqrt{\theta}$ 3017. | $w\sqrt{\theta}/\delta$ 138.4 |
|---|---|---|---|---|

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.396 | 14.370 | 13.033 | 9.668 | 6.298 |
| V 3 | 211.01 | 222.89 | 229.99 | 233.65 | 234.02 |
| V 4 | 227.86 | 242.60 | 248.65 | 251.36 | 246.56 |
| VZ 3 | 210.98 | 222.63 | 229.97 | 233.63 | 234.01 |
| VZ 4 | 219.68 | 233.86 | 242.23 | 247.78 | 245.07 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 60.50 | 60.21 | 56.07 | 42.21 | 27.05 |
| M 3 | 0.1897 | 0.2005 | 0.2069 | 0.2102 | 0.2106 |
| M 4 | 0.2050 | 0.2183 | 0.2238 | 0.2263 | 0.2219 |
| TURN | -15.40 | -14.37 | -13.03 | -9.67 | -6.30 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.067 | 0.049 | 0.042 | 0.015 | 0.004 |
| EFFP | 0.8879 | 0.9432 | 0.8516 | 0.9386 | 0.7475 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.304 | 4.630 | 4.167 | 5.932 | 9.002 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 33.385 | 31.906 | 30.921 | 27.211 | 23.375 |
| BETA 10 | 15.756 | 14.730 | 14.113 | 13.465 | 13.356 |
| V 9 | 371.28 | 348.29 | 330.41 | 330.48 | 327.75 |
| V 10 | 351.45 | 333.98 | 320.69 | 321.52 | 326.62 |
| VZ 9 | 305.36 | 293.96 | 283.00 | 293.88 | 300.81 |
| VZ 10 | 336.36 | 321.03 | 310.53 | 312.66 | 317.71 |
| V-THETA 9 | 204.30 | 184.08 | 169.78 | 151.12 | 130.04 |
| V-THETA 10 | 95.43 | 84.92 | 78.20 | 74.87 | 75.45 |
| M 9 | 0.3335 | 0.3125 | 0.2961 | 0.2961 | 0.2935 |
| M 10 | 0.3153 | 0.2994 | 0.2873 | 0.2879 | 0.2924 |
| TURN | 17.628 | 17.176 | 16.807 | 13.746 | 10.020 |
| $\bar{\omega}$ | 0.0656 | 0.0445 | 0.0277 | 0.0667 | 0.0915 |
| DFAC | 0.1604 | 0.1567 | 0.1506 | 0.1347 | 0.0854 |
| EFFP | 0.5142 | 0.5365 | 0.5276 | -0.1006 | -8.9810 |
| INCIDM | -12.015 | -9.694 | -8.279 | -11.289 | -17.125 |
| DEVM | 11.456 | 9.230 | 8.613 | 8.465 | 9.256 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 13.820 | 13.159 | 12.081 | 9.098 | 5.844 |
| BETA 7 | 34.954 | 33.404 | 32.142 | 28.366 | 23.903 |
| BETA(PR) 6 | 46.307 | 50.430 | 55.144 | 59.285 | 63.780 |
| BETA(PR) 7 | 21.643 | 34.641 | 43.287 | 49.152 | 53.707 |
| V 6 | 245.29 | 260.04 | 262.18 | 263.99 | 253.55 |
| V 7 | 372.15 | 340.98 | 324.26 | 321.97 | 322.51 |
| VZ 6 | 238.13 | 253.03 | 256.32 | 260.66 | 252.23 |
| VZ 7 | 303.71 | 284.39 | 274.43 | 283.27 | 294.64 |
| V-THETA 6 | 58.59 | 59.19 | 54.87 | 41.70 | 25.92 |
| V-THETA 7 | 213.21 | 187.72 | 172.51 | 152.97 | 131.14 |
| V(PR) 6 | 344.8 | 397.3 | 448.5 | 510.3 | 570.9 |
| V(PR) 7 | 328.2 | 346.0 | 377.2 | 433.2 | 497.9 |
| VTHETA PR6 | -249.2 | -306.2 | -368.0 | -438.7 | -512.1 |
| VTHETA PR7 | -121.0 | -196.7 | -258.6 | -327.7 | -401.2 |
| U 6 | 307.84 | 365.37 | 422.90 | 480.43 | 537.05 |
| U 7 | 334.24 | 384.39 | 431.12 | 490.62 | 532.36 |
| M 6 | 0.2208 | 0.2342 | 0.2361 | 0.2378 | 0.2292 |
| M 7 | 0.3343 | 0.3058 | 0.2905 | 0.2883 | 0.2897 |
| M(PR) 6 | 0.3103 | 0.3578 | 0.4040 | 0.4597 | 0.5142 |
| M(PR) 7 | 0.2947 | 0.3103 | 0.3379 | 0.3879 | 0.4456 |
| TURN(PR) | 24.657 | 15.768 | 11.852 | 10.132 | 10.072 |
| $\bar{\omega}$ | 0.0326 | 0.0388 | 0.0508 | 0.0611 | 0.0910 |
| DFAC | .2175 | .2592 | .2703 | .2484 | .2144 |
| EFFP | 0.9642 | 0.9860 | 0.9321 | 0.9415 | 0.9714 |
| EFF | 0.9639 | 0.9859 | 0.9337 | 0.9410 | 0.9711 |
| INCIDM | -2.293 | -2.070 | -0.956 | -0.315 | 0.580 |
| DEVM | 2/843 | 2.141 | 1.187 | 0.552 | 0.807 |

Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 70PERCENT SPEED | PT.209 | INTERMEDIATE | 4223. | 129.8 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.450 | 14.805 | 13.770 | 9.872 | 6.553 |
| V 3 | 198.07 | 208.47 | 214.94 | 218.65 | 219.27 |
| V 4 | 205.42 | 223.38 | 232.27 | 238.25 | 235.88 |
| VZ 3 | 198.06 | 208.12 | 214.94 | 218.65 | 219.26 |
| VZ 4 | 197.97 | 214.93 | 225.54 | 234.70 | 234.34 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 54.72 | 57.08 | 55.28 | 40.84 | 26.92 |
| M 3 | 0.1780 | 0.1874 | 0.1933 | 0.1966 | 0.1972 |
| M 4 | 0.1846 | 0.2009 | 0.2090 | 0.2144 | 0.2122 |
| TURN | -15.45 | -14.80 | -13.77 | -9.87 | -6.55 |
| $\bar{\omega}$ | 0.0250 | | 0.0240 | | 0.0200 |
| DFAC | 0.105 | 0.067 | 0.049 | 0.004 | -0.014 |
| EFFP | 0.8255 | 1.0221 | 0.9021 | 0.9789 | 0.8144 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.250 | 4.195 | 3.430 | 5.728 | 8.747 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 52.409 | 53.685 | 52.804 | 49.016 | 46.602 |
| BETA 10 | 23.853 | 16.868 | 14.378 | 13.971 | 10.724 |
| V 9 | 419.38 | 388.73 | 394.27 | 416.16 | 427.50 |
| V 10 | 211.81 | 264.72 | 264.12 | 310.97 | 360.01 |
| VZ 9 | 251.93 | 228.65 | 237.68 | 272.81 | 293.71 |
| VZ 10 | 191.18 | 251.22 | 254.98 | 301.57 | 353.71 |
| V-THETA 9 | 332.31 | 313.22 | 314.06 | 314.16 | 310.62 |
| V-THETA 10 | 85.65 | 76.81 | 65.59 | 75.08 | 66.99 |
| M 9 | 0.3728 | 0.3446 | 0.3486 | 0.3669 | 0.3756 |
| M 10 | 0.1864 | 0.2333 | 0.2321 | 0.2728 | 0.3151 |
| TURN | 28.556 | 36.817 | 38.425 | 35.045 | 35.878 |
| $\bar{\omega}$ | 0.3699 | 0.1575 | 0.2490 | 0.2257 | 0.1483 |
| DFAC | 0.7150 | 0.5686 | 0.6075 | 0.5206 | 0.4360 |
| EFFP | 0.5027 | 0.7265 | 0.5494 | 0.4756 | 0.4468 |
| INCIDM | 7.009 | 12.085 | 13.604 | 10.516 | 6.102 |
| DEVM | 19.553 | 11.368 | 8.878 | 8.971 | 6.624 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 13.898 | 13.794 | 12.978 | 9.258 | 5.986 |
| BETA 7 | 52.725 | 54.769 | 54.129 | 50.530 | 48.622 |
| BETA(PR) 6 | 60.428 | 63.345 | 66.316 | 68.571 | 71.326 |
| BETA(PR) 7 | 25.565 | 44.342 | 51.359 | 54.033 | 57.730 |
| V 6 | 220.94 | 235.55 | 242.07 | 251.36 | 247.14 |
| V 7 | 431.01 | 389.72 | 391.02 | 408.19 | 414.62 |
| VZ 6 | 214.40 | 228.52 | 235.81 | 248.05 | 245.70 |
| VZ 7 | 259.22 | 224.51 | 228.95 | 259.41 | 274.07 |
| V-THETA 6 | 53.07 | 56.16 | 54.36 | 40.44 | 25.77 |
| V-THETA 7 | 342.97 | 318.33 | 316.86 | 315.11 | 311.12 |
| V(PR) 6 | 434.5 | 509.5 | 587.1 | 679.0 | 767.6 |
| V(PR) 7 | 289.4 | 314.4 | 366.9 | 441.8 | 513.3 |
| VTHETA PR6 | -377.8 | -455.3 | -537.6 | -632.0 | -727.2 |
| VTHETA PR7 | -124.9 | -219.7 | -286.6 | -357.6 | -434.0 |
| U 6 | 430.90 | 511.42 | 591.95 | 672.47 | 752.99 |
| U 7 | 467.84 | 538.05 | 603.46 | 672.74 | 745.16 |
| M 6 | 0.1987 | 0.2119 | 0.2179 | 0.2263 | 0.2225 |
| M 7 | 0.3834 | 0.3455 | 0.3457 | 0.3599 | 0.3641 |
| M(PR) 6 | 0.3907 | 0.4584 | 0.5293 | 0.6113 | 0.6910 |
| M(PR) 7 | 0.2574 | 0.2787 | 0.3244 | 0.3895 | 0.4508 |
| TURN(PR) | 34.853 | 18.980 | 14.949 | 14.531 | 13.596 |
| $\bar{\omega}$ | 0.0863 | 0.1686 | 0.2466 | 0.2125 | 0.2588 |
| DFAC | .5821 | .5875 | .5639 | .5299 | .5055 |
| EFFP | 1.0037 | 0.9638 | 0.9353 | 0.9048 | 0.8524 |
| EFF | 1.0038 | 0.9631 | 0.9338 | 0.9023 | 0.8482 |
| INCIDM | 11.828 | 10.845 | 10.216 | 8.991 | 8.126 |
| DEVM | 6.765 | 11.842 | 9.259 | 5.438 | 4.830 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70PERCENT SPEED PT.210 | INTERMEDIATE | 4246. | 142.0 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | C.000 | C.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 16.104 | 14.628 | 13.501 | 9.995 | 6.416 |
| V 3 | 217.55 | 229.42 | 236.60 | 240.10 | 239.43 |
| V 4 | 228.53 | 246.09 | 254.85 | 261.25 | 259.69 |
| VZ 3 | 217.55 | 229.06 | 236.59 | 240.09 | 239.42 |
| VZ 4 | 219.54 | 236.92 | 247.74 | 257.25 | 258.06 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 63.39 | 62.15 | 59.50 | 45.35 | 29.02 |
| M 3 | 0.1956 | 0.2064 | 0.2129 | 0.2161 | 0.2155 |
| M 4 | 0.2056 | C.2215 | 0.2295 | 0.2353 | 0.2339 |
| TURN | -16.10 | -14.63 | -13.50 | -10.00 | -6.42 |
| $\bar{\omega}$ | 0.0220 | | 0.0226 | | 0.0220 |
| DFAC | 0.099 | C.065 | 0.050 | 0.007 | -0.024 |
| EFFP | C.8201 | C.9621 | 0.8723 | C.9802 | 0.8045 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 4.596 | 4.372 | 3.699 | 5.605 | 8.884 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 49.303 | 48.786 | 47.297 | 43.936 | 41.839 |
| BETA 10 | 21.760 | 15.806 | 13.931 | 14.176 | 13.657 |
| V 9 | 424.94 | 402.50 | 406.34 | 426.65 | 437.75 |
| V 10 | 250.08 | 295.26 | 295.75 | 337.59 | 375.39 |
| VZ 9 | 272.56 | 263.41 | 275.0C | 307.22 | 325.97 |
| VZ 10 | 229.65 | 281.87 | 286.36 | 327.27 | 364.65 |
| V-THETA 9 | 322.18 | 302.78 | 298.61 | 296.03 | 292.00 |
| V-THETA 10 | 92.71 | 80.42 | 71.20 | 82.68 | 88.64 |
| M 9 | 0.3783 | 0.3575 | 0.3601 | 0.3773 | 0.3862 |
| M 10 | 0.2206 | C.2608 | 0.2607 | 0.2971 | 0.3300 |
| TURN | 27.544 | 32.980 | 33.366 | 29.760 | 28.182 |
| $\bar{\omega}$ | 0.3136 | 0.1211 | 0.1987 | 0.1444 | 0.1279 |
| DFAC | C.6130 | C.4930 | 0.5184 | 0.4419 | 0.3695 |
| EFFP | 0.5449 | 0.7462 | 0.6135 | 0.6618 | 0.6645 |
| INCIDM | 3.903 | 7.186 | 8.097 | 5.436 | 1.339 |
| DEVM | 17.460 | 10.306 | 8.431 | 9.176 | 9.557 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.548 | 13.565 | 12.556 | 9.306 | 5.898 |
| BETA 7 | 49.874 | 50.049 | 48.843 | 45.435 | 41.430 |
| BETA(PR) 6 | 57.508 | 60.766 | 63.935 | 66.478 | 69.921 |
| BETA(PR) 7 | 25.997 | 42.107 | 49.269 | 52.435 | 55.172 |
| V 6 | 244.71 | 261.04 | 269.04 | 278.40 | 268.09 |
| V 7 | 435.99 | 401.63 | 399.91 | 416.30 | 430.74 |
| VZ 6 | 236.78 | 253.52 | 262.52 | 274.70 | 266.67 |
| VZ 7 | 279.15 | 257.57 | 263.00 | 292.06 | 322.95 |
| V-THETA 6 | 61.47 | 61.23 | 58.49 | 45.02 | 27.55 |
| V-THETA 7 | 333.37 | 307.89 | 301.09 | 296.59 | 285.02 |
| V(PR) 6 | 440.8 | 519.2 | 597.5 | 688.3 | 776.8 |
| V(PR) 7 | 312.6 | 347.6 | 403.4 | 479.2 | 565.5 |
| VTHETA PR6 | -371.8 | -453.0 | -536.7 | -631.1 | -729.5 |
| VTHETA PR7 | -137.0 | -233.1 | -305.7 | -379.8 | -464.2 |
| U 6 | 433.25 | 514.21 | 595.17 | 676.13 | 757.09 |
| U 7 | 470.39 | 540.98 | 606.75 | 676.41 | 749.22 |
| M 6 | 0.2203 | 0.2351 | 0.2424 | 0.2509 | 0.2415 |
| M 7 | 0.3884 | 0.3567 | 0.3544 | 0.3680 | 0.3799 |
| M(PR) 6 | 0.3968 | 0.4677 | 0.5383 | 0.6204 | 0.6998 |
| M(PR) 7 | 0.2785 | 0.3088 | 0.3575 | 0.4236 | 0.4988 |
| TURN(PR) | 31.501 | 18.636 | 14.657 | 14.041 | 14.749 |
| $\bar{\omega}$ | 0.0611 | 0.1429 | 0.1645 | 0.1406 | 0.1918 |
| DFAC | .5211 | .5197 | .4964 | .4669 | .4274 |
| EFFP | 1.0153 | 1.0022 | 0.9747 | 0.9386 | 0.9283 |
| EFF | 1.0156 | 1.0023 | 0.9742 | 0.9371 | 0.9264 |
| INCIDM | 8.908 | 8.266 | 7.835 | 6.887 | 6.721 |
| DEVM | 7.147 | 9.607 | 7.169 | 3.835 | 2.272 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70PERCENT SPEED PT.211 | INTERMEDIATE | 4227. | 153.5 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.194 | 14.516 | 13.354 | 9.732 | 6.957 |
| V 3 | 249.92 | 264.58 | 273.96 | 279.28 | 280.22 |
| V 4 | 268.77 | 286.85 | 295.62 | 303.33 | 297.89 |
| VZ 3 | 249.90 | 264.23 | 273.95 | 279.27 | 280.21 |
| VZ 4 | 259.37 | 276.00 | 287.61 | 298.96 | 295.69 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 70.44 | 71.90 | 68.28 | 51.28 | 36.08 |
| M 3 | 0.2250 | 0.2383 | 0.2469 | 0.2517 | 0.2526 |
| M 4 | 0.2422 | 0.2587 | 0.2667 | 0.2737 | 0.2686 |
| TURN | -15.19 | -14.52 | -13.35 | -9.73 | -6.96 |
| $\bar{\omega}$ | 0.0200 | | 0.0247 | | 0.0190 |
| DFAC | 0.069 | 0.054 | 0.046 | 0.006 | 0.001 |
| EFFP | 0.7646 | 0.8644 | 0.7805 | 0.9485 | 0.7273 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.506 | 4.484 | 3.846 | 5.868 | 8.343 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 44.566 | 41.918 | 41.112 | 37.902 | 36.004 |
| BETA 10 | 7.544 | 6.165 | 5.962 | 6.108 | 5.789 |
| V 9 | 456.47 | 434.67 | 426.34 | 435.19 | 441.22 |
| V 10 | 330.15 | 336.44 | 342.94 | 371.73 | 400.29 |
| VZ 9 | 319.48 | 320.93 | 320.36 | 343.28 | 356.92 |
| VZ 10 | 324.83 | 331.64 | 340.11 | 369.48 | 398.21 |
| V-THETA 9 | 320.32 | 290.38 | 280.33 | 267.34 | 259.37 |
| V-THETA 10 | 43.34 | 36.13 | 35.62 | 39.55 | 40.37 |
| M 9 | 0.4075 | 0.3876 | 0.3793 | 0.3865 | 0.3907 |
| M 10 | 0.2924 | 0.2983 | 0.3036 | 0.3289 | 0.3535 |
| TURN | 37.023 | 35.753 | 35.150 | 31.793 | 30.215 |
| $\bar{\omega}$ | 0.1292 | 0.1007 | 0.0817 | 0.0654 | 0.0506 |
| DFAC | 0.5058 | 0.4670 | 0.4486 | 0.3898 | 0.3349 |
| EFFP | 0.7603 | 0.7663 | 0.7727 | 0.8096 | 0.8748 |
| INCIDM | -0.834 | 0.318 | 1.912 | -0.598 | 4.496 |
| DEVM | 3.244 | 0.665 | 0.462 | 1.108 | 1.289 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 35.495 | 40.865 |
| BETA 6 | 13.794 | 13.412 | 12.353 | 9.133 | 6.442 |
| BETA 7 | 45.737 | 43.407 | 42.578 | 39.232 | 37.420 |
| BETA(PR) 6 | 52.603 | 56.057 | 59.881 | 63.031 | 66.765 |
| BETA(PR) 7 | 22.631 | 37.766 | 45.994 | 51.065 | 54.845 |
| V 6 | 285.93 | 305.39 | 312.27 | 326.74 | 310.59 |
| V 7 | 464.98 | 430.84 | 419.77 | 423.73 | 420.79 |
| VZ 6 | 277.61 | 296.76 | 304.97 | 316.68 | 308.62 |
| VZ 7 | 322.90 | 312.67 | 309.91 | 327.92 | 341.34 |
| V-THETA 6 | 68.17 | 70.83 | 66.80 | 52.74 | 34.84 |
| V-THETA 7 | 332.99 | 296.06 | 284.02 | 258.28 | 261.17 |
| V(PR) 6 | 457.1 | 531.8 | 607.8 | 693.3 | 782.2 |
| V(PR) 7 | 351.6 | 395.9 | 444.9 | 521.2 | 502.8 |
| VTHETA PR6 | -363.1 | -441.1 | -525.7 | -622.4 | -718.9 |
| VTHETA PR7 | -135.3 | -242.5 | -320.0 | -405.1 | -484.7 |
| U 6 | 431.31 | 511.91 | 592.51 | 673.11 | 753.70 |
| U 7 | 468.29 | 538.56 | 604.02 | 673.38 | 745.87 |
| M 6 | 0.2578 | 0.2756 | 0.2810 | 0.2897 | 0.2804 |
| M 7 | 0.4154 | 0.3841 | 0.3734 | 0.3762 | 0.3804 |
| M(PR) 6 | 0.4122 | 0.4799 | 0.5487 | 0.6307 | 0.7062 |
| M(PR) 7 | 0.3141 | 0.3530 | 0.3959 | 0.4627 | 0.5247 |
| TURN(PR) | 29.964 | 18.274 | 13.883 | 12.025 | 11.022 |
| $\bar{\omega}$ | 0.0203 | 0.0186 | 0.0496 | 0.0694 | 0.0971 |
| DFAC | .4470 | .4361 | .4193 | .3927 | .3778 |
| EFFP | 0.9526 | 1.0121 | 0.9886 | 0.9612 | 0.9134 |
| EFF | 0.9517 | 1.0195 | 0.9894 | 0.9604 | 0.9113 |
| INCIDM | 4.003 | 3.567 | 3.781 | 3.431 | 3.565 |
| DEVM | 3.831 | 5.266 | 3.894 | 2.405 | 1.945 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 7CPERCENT SPEED PT.212 | INTERMEDIATE | 4230. | 180.3 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | C.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.445 | 14.792 | 13.199 | 9.715 | 5.467 |
| V 3 | 279.56 | 295.34 | 304.90 | 309.63 | 309.72 |
| V 4 | 300.10 | 320.65 | 327.97 | 332.32 | 327.61 |
| VZ 3 | 279.53 | 294.98 | 304.88 | 309.61 | 309.71 |
| VZ 4 | 289.25 | 308.44 | 319.28 | 327.54 | 326.12 |
| V-THETA 3 | C.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 79.92 | 81.86 | 74.89 | 56.08 | 31.21 |
| M 3 | 0.2520 | 0.2664 | 0.2752 | 0.2795 | 0.2796 |
| M 4 | 0.2708 | 0.2896 | 0.2964 | 0.3003 | 0.2960 |
| TURN | -15.45 | -14.79 | -13.20 | -9.71 | -5.47 |
| $\bar{\omega}$ | 0.0180 | | 0.0228 | | 0.0230 |
| DFAC | 0.073 | 0.055 | 0.048 | C.018 | -0.007 |
| EFFP | 1.9216 | 1.7942 | 1.4591 | 1.7423 | 1.4428 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.255 | 4.208 | 4.001 | 5.885 | 9.833 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 37.055 | 36.847 | 34.636 | 31.700 | 28.368 |
| BETA 10 | 15.212 | 13.869 | 13.445 | 13.162 | 12.935 |
| V 9 | 492.91 | 460.99 | 452.70 | 455.48 | 455.47 |
| V 10 | 423.88 | 409.06 | 404.94 | 414.35 | 427.59 |
| VZ 9 | 387.19 | 366.59 | 371.86 | 387.51 | 400.66 |
| VZ 10 | 406.47 | 394.50 | 393.20 | 403.45 | 416.60 |
| V-THETA 9 | 297.02 | 276.45 | 257.30 | 239.34 | 216.41 |
| V-THETA 10 | 111.22 | 98.06 | 94.16 | 94.35 | 95.71 |
| M 9 | 0.4424 | 0.4127 | 0.4047 | 0.4065 | 0.4057 |
| M 10 | C.3785 | 0.3649 | 0.3608 | 0.3688 | 0.3802 |
| TURN | 21.843 | 22.978 | 21.191 | 18.538 | 15.433 |
| $\bar{\omega}$ | 0.0880 | 0.0444 | 0.0553 | 0.0576 | 0.0445 |
| DFAC | 0.2794 | C.2707 | 0.2636 | 0.2387 | 0.1910 |
| EFFP | C.7183 | 0.8066 | 0.7234 | 0.7319 | 1.0414 |
| INCIDM | -8.345 | -4.753 | -4.564 | -6.800 | -12.132 |
| DEVM | 10.912 | 8.369 | 7.945 | 8.162 | 8.835 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 13.868 | 13.530 | 12.092 | 9.086 | 5.124 |
| BETA 7 | 38.397 | 38.408 | 36.119 | 32.973 | 28.685 |
| BETA(PR) 6 | 48.505 | 52.332 | 56.778 | 60.611 | 65.186 |
| BETA(PR) 7 | 22.269 | 35.884 | 43.771 | 49.490 | 53.522 |
| V 6 | 322.84 | 343.26 | 348.34 | 352.47 | 336.19 |
| V 7 | 497.45 | 453.59 | 443.37 | 441.54 | 447.88 |
| VZ 6 | 313.35 | 333.48 | 340.53 | 348.02 | 334.85 |
| VZ 7 | 388.03 | 355.09 | 357.96 | 370.35 | 392.90 |
| V-THETA 6 | 77.38 | 80.31 | 72.97 | 55.66 | 30.03 |
| V-THETA 7 | 308.97 | 281.80 | 261.35 | 240.30 | 214.98 |
| V(PR) 6 | 473.0 | 545.9 | 621.6 | 709.2 | 797.9 |
| V(PR) 7 | 421.3 | 438.7 | 496.0 | 570.2 | 660.9 |
| VTHETA PR6 | -354.2 | -432.0 | -520.0 | -617.9 | -724.2 |
| VTHETA PR7 | -159.6 | -257.1 | -343.1 | -433.6 | -531.4 |
| U 6 | 431.61 | 512.27 | 592.93 | 673.58 | 754.24 |
| U 7 | 468.62 | 538.94 | 604.46 | 673.86 | 746.39 |
| M 6 | 0.2916 | 0.3104 | 0.3151 | 0.3189 | 0.3039 |
| M 7 | 0.4466 | 0.4059 | 0.3961 | 0.3938 | 0.3988 |
| M(PR) 6 | 0.4273 | 0.4937 | 0.5623 | 0.6417 | 0.7213 |
| M(PR) 7 | 0.3782 | 0.3925 | 0.4431 | 0.5086 | 0.5885 |
| TURN(PR) | 26.228 | 16.426 | 13.001 | 11.120 | 11.664 |
| $\bar{\omega}$ | 0.0278 | 0.0187 | 0.0342 | 0.0745 | 0.1075 |
| DFAC | .2936 | .3443 | .3305 | .3122 | .2803 |
| EFFP | 0.9990 | 0.9840 | 0.9967 | 0.9629 | 0.9370 |
| EFF | 0.9990 | 0.9837 | 0.9966 | 0.9622 | 0.9357 |
| INCIDM | -0.095 | -0.168 | 0.678 | 1.011 | 1.986 |
| DEVM | 3.469 | 3.384 | 1.671 | 0.890 | 0.622 |

# Table B-4. Blade Element Data Intermediate Configuration

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 70PERCENT SPEED PT.208 | INTERMEDIATE | 4245. | 123.5 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.294 | 14.590 | 13.252 | 9.566 | 6.105 |
| V 3 | 301.87 | 318.99 | 329.21 | 334.33 | 334.48 |
| V 4 | 325.46 | 349.51 | 357.87 | 361.43 | 352.83 |
| VZ 3 | 301.83 | 318.62 | 329.19 | 334.31 | 334.46 |
| VZ 4 | 313.93 | 335.65 | 349.32 | 356.40 | 350.83 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 85.85 | 87.79 | 82.04 | 60.06 | 37.52 |
| M 3 | 0.2724 | 0.2881 | 0.2975 | 0.3022 | 0.3023 |
| M 4 | 0.2940 | 0.3153 | 0.3239 | 0.3272 | 0.3192 |
| TURN | -15.29 | -14.59 | -13.25 | -9.57 | -6.10 |
| $\bar{\omega}$ | 0.0180 | | 0.0254 | | 0.0230 |
| DFAC | 0.068 | 0.047 | 0.038 | 0.009 | 0.001 |
| EFFP | 1.0006 | 1.1037 | 0.9833 | 1.0736 | 0.7719 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.406 | 4.050 | 3.948 | 6.034 | 9.195 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 31.657 | 31.099 | 29.875 | 26.229 | 23.170 |
| BETA 10 | 15.579 | 13.899 | 13.590 | 12.885 | 13.157 |
| V 9 | 514.98 | 485.15 | 460.96 | 460.52 | 451.76 |
| V 10 | 491.21 | 467.68 | 450.83 | 451.06 | 458.38 |
| VZ 9 | 431.76 | 413.02 | 399.07 | 413.07 | 415.25 |
| VZ 10 | 470.49 | 451.20 | 437.53 | 439.67 | 446.24 |
| V-THETA 9 | 270.28 | 250.59 | 229.61 | 203.53 | 177.75 |
| V-THETA 10 | 131.92 | 112.34 | 105.93 | 100.59 | 104.33 |
| M 9 | 0.4641 | 0.4363 | 0.4136 | 0.4129 | 0.4044 |
| M 10 | 0.4419 | 0.4201 | 0.4042 | 0.4042 | 0.4106 |
| TURN | 16.078 | 17.200 | 16.286 | 13.344 | 10.013 |
| $\bar{\omega}$ | 0.0729 | 0.0588 | 0.0290 | 0.0626 | 0.0784 |
| DFAC | 0.1438 | 0.1518 | 0.1393 | 0.1243 | 0.0653 |
| EFFP | 0.3507 | 0.3420 | 0.4084 | -0.2657 | 1.6330 |
| INCIDM | -13.743 | -10.501 | -9.325 | -12.271 | -17.330 |
| DEVM | 11.279 | 8.399 | 8.090 | 7.885 | 9.057 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.965 |
| BETA 6 | 13.662 | 13.310 | 12.111 | 8.967 | 5.513 |
| BETA 7 | 32.07[illegible] | 32.551 | 31.332 | 27.393 | 23.097 |
| BETA(PR) 6 | 45.672 | 49.524 | 54.302 | 58.579 | 63.304 |
| BETA(PR) 7 | 23.543 | 35.519 | 44.029 | 49.843 | 54.395 |
| V 6 | 351.94 | 375.20 | 378.91 | 381.32 | 363.33 |
| V 7 | 516.34 | 474.55 | 450.97 | 447.15 | 446.69 |
| VZ 6 | 341.91 | 364.97 | 370.41 | 376.64 | 361.64 |
| VZ 7 | 430.76 | 399.64 | 385.03 | 396.96 | 410.88 |
| V-THETA 6 | 83.12 | 86.40 | 79.50 | 59.44 | 34.9[illegible] |
| V-THETA 7 | 281.75 | 255.33 | 234.50 | 205.73 | 175.23 |
| V(PR) 6 | 489.4 | 562.4 | 634.8 | 722.5 | 807.5 |
| V(PR) 7 | 472.0 | 491.5 | 535.6 | 615.6 | 705.7 |
| VTHETA PR6 | -350.0 | -427.7 | -515.5 | -616.5 | -722.0 |
| VTHETA PR7 | -188.5 | -285.5 | -372.1 | -470.5 | -573.8 |
| U 6 | 433.14 | 514.09 | 595.03 | 675.97 | 756.91 |
| U 7 | 470.28 | 540.85 | 606.61 | 676.25 | 749.04 |
| M 6 | 0.3184 | 0.3400 | 0.3434 | 0.3456 | 0.3290 |
| M 7 | 0.4654 | 0.4265 | 0.4044 | 0.4006 | 0.3998 |
| M(PR) 6 | 0.4428 | 0.5096 | 0.5753 | 0.6549 | 0.7311 |
| M(PR) 7 | 0.4254 | 0.4417 | 0.4803 | 0.5515 | 0.6316 |
| TURN(PR) | 22.122 | 13.986 | 10.289 | 8.734 | 8.999 |
| $\bar{\omega}$ | 0.0241 | 0.0297 | 0.0439 | 0.0713 | 0.0874 |
| DFAC | .1893 | .2471 | .2600 | .2383 | .2076 |
| EFFP | 1.0355 | 1.0430 | 0.9809 | 0.9845 | 1.0089 |
| EFF | 1.0362 | 1.0436 | 0.9806 | 0.9843 | 1.00[illegible] |
| INCIDM | -2.928 | -2.976 | -1.798 | -1.021 | 0.194 |
| DEVM | 4.743 | 3.019 | 1.909 | 1.243 | 1.495 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 80PERCENT SPEED | PT.203 | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| | | INTERMEDIATE | 4842. | 146.4 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.372 | 14.756 | 14.080 | 10.471 | 7.576 |
| V 3 | 220.27 | 233.85 | 243.83 | 249.58 | 250.56 |
| V 4 | 236.48 | 253.11 | 262.21 | 271.34 | 269.66 |
| VZ 3 | 220.26 | 233.54 | 243.82 | 249.57 | 250.55 |
| VZ 4 | 228.02 | 242.56 | 254.33 | 266.82 | 267.30 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 62.69 | 64.47 | 63.79 | 49.31 | 35.55 |
| M 3 | 0.1981 | 0.2104 | 0.2195 | 0.2247 | 0.2256 |
| M 4 | 0.2128 | 0.2279 | 0.2362 | 0.2445 | 0.2430 |
| TURN | -15.37 | -14.76 | -14.08 | -10.47 | -7.58 |
| $\bar{\omega}$ | 0.0806 | 0.1975 | 0.2936 | 0.2517 | 0.3063 |
| DFAC | 0.072 | 0.057 | 0.056 | 0.012 | -0.005 |
| EFFP | 0.8219 | 0.9152 | 0.8703 | 0.9864 | 0.7904 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.328 | 4.244 | 3.120 | 5.129 | 7.724 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 60.076 | 57.187 | 50.682 | 47.030 | 47.114 |
| BETA 10 | 24.851 | 17.066 | 13.945 | 13.185 | 11.562 |
| V 9 | 484.80 | 453.55 | 445.85 | 462.05 | 470.83 |
| V 10 | 217.82 | 297.02 | 290.13 | 340.44 | 407.36 |
| VZ 9 | 236.45 | 242.75 | 281.15 | 314.73 | 320.41 |
| VZ 10 | 195.50 | 280.01 | 280.02 | 331.13 | 399.57 |
| V-THETA 9 | 420.17 | 381.18 | 344.93 | 338.08 | 344.99 |
| V-THETA 10 | 91.54 | 87.17 | 69.02 | 77.65 | 81.75 |
| M 9 | 0.4285 | 0.4000 | 0.3931 | 0.4061 | 0.4116 |
| M 10 | 0.1898 | 0.2596 | 0.2535 | 0.2973 | 0.3552 |
| TURN | 35.225 | 40.122 | 36.738 | 33.945 | 35.552 |
| $\bar{\omega}$ | 0.4073 | 0.2175 | 0.3109 | 0.2671 | 0.1257 |
| DFAC | 0.8051 | 0.6113 | 0.6208 | 0.5260 | 0.4067 |
| EFFP | 0.5021 | 0.5819 | 0.3573 | 0.3117 | 0.4150 |
| INCIDM | 14.676 | 15.587 | 11.482 | 8.530 | 6.614 |
| DEVM | 20.551 | 11.566 | 8.445 | 8.185 | 7.462 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.232 | 13.939 | 13.044 | 9.673 | 7.071 |
| BETA 7 | 60.100 | 58.485 | 52.478 | 49.517 | 48.932 |
| BETA(PR) 6 | 61.150 | 63.927 | 66.241 | 69.352 | 71.042 |
| BETA(PR) 7 | 22.238 | 43.683 | 51.626 | 55.212 | 50.631 |
| V 6 | 246.42 | 263.96 | 278.36 | 290.78 | 293.51 |
| V 7 | 500.90 | 456.39 | 442.89 | 453.04 | 455.66 |
| VZ 6 | 238.79 | 255.81 | 271.12 | 286.63 | 291.35 |
| VZ 7 | 248.22 | 238.30 | 269.57 | 300.02 | 299.34 |
| V-THETA 6 | 60.61 | 63.59 | 62.82 | 48.86 | 34.00 |
| V-THETA 7 | 434.31 | 389.07 | 351.26 | 339.39 | 343.54 |
| V(PR) 6 | 494.9 | 582.2 | 672.9 | 777.0 | 874.0 |
| V(PR) 7 | 269.8 | 329.9 | 434.5 | 526.0 | 592.1 |
| VTHETA PR6 | -433.5 | -522.8 | -615.9 | -722.2 | -828.5 |
| VTHETA PR7 | -102.1 | -227.8 | -340.7 | -432.0 | -510.8 |
| U 6 | 494.06 | 586.39 | 678.71 | 771.04 | 863.36 |
| U 7 | 536.42 | 616.91 | 691.92 | 771.25 | 854.38 |
| M 6 | 0.2218 | 0.2378 | 0.2509 | 0.2622 | 0.2556 |
| M 7 | 0.4434 | 0.4026 | 0.3904 | 0.3982 | 0.3991 |
| M(PR) 6 | 0.4455 | 0.5244 | 0.6066 | 0.7008 | 0.7888 |
| M(PR) 7 | 0.2389 | 0.2910 | 0.3830 | 0.4623 | 0.5173 |
| TURN(PR) | 38.905 | 20.211 | 14.610 | 13.139 | 11.611 |
| $\omega$ | 0.0806 | 0.1975 | 0.2936 | 0.2517 | 0.3063 |
| DFAC | .7353 | .6554 | .5353 | .4900 | .4886 |
| EFFP | 0.8967 | 0.9259 | 0.9967 | 0.9770 | 0.8836 |
| EFF | 0.8938 | 0.9238 | 0.9966 | 0.9742 | 0.8794 |
| INCIDM | 12.550 | 11.427 | 10.141 | 8.752 | 8.042 |
| DEVM | 3.438 | 11.183 | 9.526 | 6.612 | 6.731 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 80PERCENT SPEED | PT.204 | INTERMEDIATE | 4824. | 150.2 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.372 | 14.873 | 13.864 | 10.459 | 8.267 |
| V 3 | 229.33 | 242.54 | 251.12 | 255.24 | 254.92 |
| V 4 | 241.82 | 259.96 | 260.82 | 277.66 | 276.59 |
| VZ 3 | 229.33 | 242.17 | 251.12 | 255.23 | 254.91 |
| VZ 4 | 233.16 | 249.67 | 261.90 | 272.42 | 273.71 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 |
| V-THETA 4 | 64.10 | 66.73 | 64.65 | 50.29 | 39.77 |
| M 3 | 0.2063 | 0.2183 | 0.2261 | 0.2298 | 0.2295 |
| M 4 | 0.2176 | 0.2341 | 0.2431 | 0.2497 | 0.2493 |
| TURN | -15.37 | -14.87 | -13.86 | -10.46 | -8.27 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.089 | 0.068 | 0.055 | 0.014 | -0.007 |
| EFFP | 0.9277 | 0.9604 | 0.9182 | 0.9828 | 0.8327 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.328 | 4.127 | 3.336 | 5.141 | 7.033 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 56.647 | 54.699 | 49.473 | 46.182 | 46.414 |
| BETA 10 | 23.820 | 16.810 | 13.579 | 13.555 | 14.212 |
| V 9 | 487.29 | 461.97 | 455.25 | 478.00 | 499.59 |
| V 10 | 235.25 | 305.77 | 302.58 | 351.02 | 410.27 |
| VZ 9 | 262.81 | 264.64 | 295.06 | 330.93 | 337.41 |
| VZ 10 | 212.68 | 289.79 | 293.22 | 341.13 | 397.59 |
| V-THETA 9 | 407.03 | 377.02 | 346.04 | 344.89 | 354.63 |
| V-THETA 10 | 95.01 | 88.43 | 71.04 | 82.27 | 100.73 |
| M 9 | 0.4314 | 0.4080 | 0.4017 | 0.4264 | 0.4284 |
| M 10 | 0.2054 | 0.2676 | 0.2647 | 0.3066 | 0.3574 |
| TURN | 32.827 | 37.889 | 35.893 | 32.627 | 32.202 |
| $\bar{\omega}$ | 0.3910 | 0.2101 | 0.2766 | 0.2437 | 0.1399 |
| DFAC | 0.7573 | 0.5946 | 0.6013 | 0.5218 | 0.4153 |
| EFFP | 0.5261 | 0.6226 | 0.4692 | 0.4971 | 0.6399 |
| INCIDM | 11.247 | 13.099 | 10.273 | 7.682 | 5.914 |
| DEVM | 19.520 | 11.310 | 8.079 | 8.555 | 10.112 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.064 | 13.881 | 12.800 | 9.648 | 7.930 |
| BETA 7 | 56.778 | 56.001 | 51.043 | 47.701 | 47.117 |
| BETA(PR) 6 | 60.065 | 62.856 | 65.439 | 67.812 | 71.002 |
| BETA(PR) 7 | 22.479 | 41.651 | 49.995 | 53.434 | 56.688 |
| V 6 | 255.43 | 274.12 | 287.18 | 297.22 | 295.31 |
| V 7 | 502.63 | 463.39 | 451.50 | 466.61 | 481.30 |
| VZ 6 | 247.69 | 265.81 | 279.95 | 292.98 | 292.59 |
| VZ 7 | 273.52 | 258.77 | 283.65 | 313.03 | 327.57 |
| V-THETA 6 | 62.07 | 65.76 | 63.63 | 49.81 | 39.36 |
| V-THETA 7 | 420.48 | 384.16 | 351.09 | 345.12 | 352.74 |
| V(PR) 6 | 496.4 | 582.8 | 673.5 | 775.8 | 868.1 |
| V(PR) 7 | 298.0 | 346.9 | 441.6 | 527.1 | 596.5 |
| VTHETA PR6 | -430.2 | -518.4 | -612.6 | -718.4 | -820.8 |
| VTHETA PR7 | -113.0 | -230.5 | -338.3 | -423.4 | -498.5 |
| U 6 | 492.22 | 584.21 | 676.19 | 768.17 | 860.15 |
| U 7 | 534.43 | 614.62 | 689.34 | 768.49 | 851.21 |
| M 6 | 0.2300 | 0.2470 | 0.2590 | 0.2681 | 0.2573 |
| M 7 | 0.4455 | 0.4093 | 0.3983 | 0.4103 | 0.4212 |
| M(PR) 6 | 0.4470 | 0.5252 | 0.6074 | 0.6999 | 0.7827 |
| M(PR) 7 | 0.2642 | 0.3063 | 0.3896 | 0.4635 | 0.5218 |
| TURN(PR) | 37.579 | 21.178 | 15.436 | 14.375 | 14.315 |
| $\bar{\omega}$ | 0.0730 | 0.1749 | 0.2574 | 0.2097 | 0.2578 |
| DFAC | .6680 | .6221 | .5247 | .4905 | .4820 |
| EFFP | 0.9149 | 0.9313 | 0.9776 | 0.9478 | 0.8748 |
| EFF | 0.9125 | 0.9294 | 0.9769 | 0.9460 | 0.8703 |
| INCIDM | 11.466 | 10.356 | 9.339 | 8.212 | 7.802 |
| DEVM | 3.678 | 9.151 | 7.895 | 4.834 | 3.788 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

80PERCENT SPEED PT.205 — CONFIGURATION: INTERMEDIATE — $N/\sqrt{\theta}$: 4854. — $\omega\sqrt{\theta}/\delta$: 171.3

## INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.331 | 14.421 | 13.248 | 9.936 | 6.343 |
| V 3 | 261.38 | 277.18 | 288.08 | 294.29 | 294.83 |
| V 4 | 281.05 | 301.07 | 310.77 | 319.48 | 316.97 |
| VZ 3 | 261.37 | 276.83 | 288.07 | 294.27 | 294.82 |
| VZ 4 | 271.05 | 289.40 | 302.50 | 314.69 | 315.03 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 74.31 | 74.98 | 71.22 | 55.13 | 35.02 |
| M 3 | 0.2354 | 0.2498 | 0.2598 | 0.2655 | 0.2660 |
| M 4 | 0.2534 | 0.2717 | 0.2806 | 0.2885 | 0.2862 |
| TURN | -15.33 | -14.42 | -13.25 | -9.94 | -6.34 |
| ϖ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.071 | 0.051 | 0.046 | 0.008 | -0.016 |
| EFFP | 0.8361 | 0.9589 | 0.8601 | 0.9807 | 0.7838 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.369 | 4.579 | 3.952 | 5.664 | 8.957 |

## STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 52.598 | 49.663 | 44.798 | 41.489 | 40.156 |
| BETA 10 | 19.361 | 14.230 | 12.893 | 13.635 | 13.201 |
| V 9 | 507.20 | 480.76 | 469.41 | 494.46 | 494.66 |
| V 10 | 296.86 | 344.59 | 351.94 | 399.13 | 442.37 |
| VZ 9 | 301.86 | 308.02 | 331.84 | 370.24 | 378.01 |
| VZ 10 | 277.52 | 330.21 | 341.63 | 387.66 | 430.64 |
| V-THETA 9 | 402.91 | 366.46 | 330.75 | 327.56 | 318.99 |
| V-THETA 10 | 98.42 | 84.70 | 78.52 | 94.09 | 101.02 |
| M 9 | 0.4501 | 0.4258 | 0.4155 | 0.4365 | 0.4348 |
| M 10 | 0.2600 | 0.3025 | 0.3092 | 0.3502 | 0.3875 |
| TURN | 33.237 | 35.433 | 31.906 | 27.854 | 26.955 |
| ϖ | 0.2774 | 0.1359 | 0.1576 | 0.1397 | 0.0549 |
| DFAC | 0.6396 | 0.5239 | 0.4867 | 0.4129 | 0.3211 |
| EFFP | 0.6368 | 0.7190 | 0.6514 | 0.6517 | 0.8655 |
| INCIDM | 7.198 | 8.063 | 5.598 | 2.989 | -0.344 |
| DEVM | 15.016 | 8.730 | 7.393 | 8.635 | 9.101 |

## ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | [illegible] | [illegible] |
| BETA 6 | 14.069 | 13.447 | 12.219 | 9.191 | [illegible] |
| BETA 7 | 53.001 | 51.115 | 46.628 | 43.654 | [illegible] |
| BETA(PR) 6 | 55.889 | 59.086 | [illegible] | 64.814 | [illegible] |
| BETA(PR) 7 | 20.953 | 39.966 | 48.251 | 51.637 | [illegible] |
| V 6 | 295.72 | 316.89 | [illegible] | [illegible] | [illegible] |
| V 7 | 522.55 | 480.85 | 462.55 | [illegible] | [illegible] |
| VZ 6 | 286.78 | 307.82 | 321.91 | 337.79 | [illegible] |
| VZ 7 | 312.67 | 301.55 | 318.15 | 351.38 | [illegible] |
| V-THETA 6 | 71.89 | 73.80 | [illegible] | 54.65 | [illegible] |
| V-THETA 7 | 417.33 | 374.30 | [illegible] | 328.45 | [illegible] |
| V(PR) 6 | 511.4 | 599.3 | 690.4 | 793.8 | [illegible] |
| V(PR) 7 | 336.7 | 389.2 | 478.1 | 566.9 | [illegible] |
| VTHETA PR6 | -423.4 | -514.0 | -610.7 | -718.3 | [illegible] |
| VTHETA PR7 | -120.4 | -244.1 | -356.7 | -444.8 | [illegible] |
| U 6 | 495.28 | 587.84 | [illegible] | 772.95 | [illegible] |
| U 7 | 537.75 | 618.44 | 693.62 | 773.27 | [illegible] |
| M 6 | 0.2668 | 0.2862 | [illegible] | [illegible] | [illegible] |
| M 7 | 0.4643 | 0.4259 | [illegible] | .4244 | [illegible] |
| M(PR) 6 | 0.4614 | 0.5412 | [illegible] | 0.7178 | [illegible] |
| M(PR) 7 | 0.2992 | 0.3439 | [illegible] | [illegible] | [illegible] |
| TURN(PR) | 34.929 | [illegible] | [illegible] | 13.125 | [illegible] |
| ϖ | 0.0512 | 0.0933 | 0.1092 | 0.1132 | 0.1511 |
| DFAC | .5934 | .5519 | .4712 | .4398 | .4156 |
| EFFP | 0.8941 | 0.9417 | [illegible] | [illegible] | [illegible] |
| EFF | 0.8913 | 0.9401 | [illegible] | [illegible] | [illegible] |
| INCIDM | 7.289 | 6.586 | 6.104 | 5.214 | 5.213 |
| DEVM | 2.153 | 6.466 | 6.151 | 3.087 | 2.983 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 80PERCENT SPEED PT.206 | INTERMEDIATE | 4834. | 183.0 |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.350 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.595 | 14.402 | 13.386 | 9.747 | 6.486 |
| V 3 | 291.83 | 309.10 | 323.49 | 325.46 | 326.49 |
| V 4 | 315.29 | 338.00 | 346.90 | 353.50 | 347.90 |
| VZ 3 | 291.81 | 308.72 | 323.47 | 326.44 | 326.49 |
| VZ 4 | 303.68 | 325.30 | 337.46 | 343.39 | 345.67 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 84.76 | 84.07 | 80.31 | 59.85 | 39.30 |
| M 3 | 0.2632 | 0.2790 | 0.2895 | 0.2950 | 0.2950 |
| M 4 | 0.2847 | 0.3056 | 0.3138 | 0.3190 | 0.3147 |
| TURN | -15.59 | -14.40 | -13.39 | -9.75 | -6.49 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.069 | 0.044 | 0.044 | 0.020 | -0.005 |
| EFFP | 0.8527 | 0.9840 | 0.3811 | 0.9801 | 0.7192 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.105 | 4.598 | 3.814 | 5.853 | 8.814 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 44.443 | 44.049 | 39.443 | 35.252 | 34.990 |
| BETA 10 | 15.818 | 13.363 | 12.938 | 12.821 | 12.425 |
| V 9 | 530.30 | 498.96 | 496.13 | 502.92 | 511.68 |
| V 10 | 392.17 | 397.07 | 401.16 | 432.91 | 456.95 |
| VZ 9 | 371.83 | 355.61 | 382.13 | 410.65 | 413.59 |
| VZ 10 | 374.67 | 382.83 | 389.00 | 422.04 | 446.12 |
| V-THETA 9 | 371.32 | 346.92 | 315.19 | 290.27 | 292.69 |
| V-THETA 10 | 106.90 | 91.77 | 89.82 | 96.07 | 98.32 |
| M 9 | 0.4732 | 0.4438 | 0.4412 | 0.4466 | 0.4521 |
| M 10 | 0.3465 | 0.3507 | 0.3543 | 0.3826 | 0.4024 |
| TURN | 28.625 | 30.686 | 26.504 | 22.430 | 22.455 |
| $\bar{\omega}$ | 0.1581 | 0.0993 | 0.1564 | 0.0803 | 0.1025 |
| DFAC | 0.4465 | 0.4139 | 0.3911 | 0.3192 | 0.2927 |
| EFFP | 0.7093 | 0.7698 | 0.5988 | 0.7319 | 0.8761 |
| INCIDM | -0.957 | 2.449 | 0.243 | -3.248 | -5.610 |
| DEVM | 11.518 | 7.863 | 7.438 | 7.821 | 8.325 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.395 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.142 | 13.354 | 12.215 | 9.007 | 6.071 |
| BETA 7 | 45.507 | 45.559 | 41.446 | 36.707 | 35.021 |
| BETA(PR) 6 | 51.643 | 55.273 | 58.964 | 62.236 | 66.566 |
| BETA(PR) 7 | 21.634 | 37.031 | 45.327 | 50.782 | 53.990 |
| V 6 | 335.61 | 358.40 | 369.15 | 378.71 | 380.35 |
| V 7 | 540.24 | 495.91 | 486.42 | 497.37 | 502.67 |
| VZ 6 | 325.24 | 348.30 | 360.72 | 374.01 | 357.4 |
| VZ 7 | 376.62 | 346.83 | 364.42 | 370.66 | 411.65 |
| V-THETA 6 | 92.04 | 82.78 | 78.11 | 59.29 | 37.38 |
| V-THETA 7 | 385.37 | 353.99 | 321.97 | 291.31 | 298.47 |
| V(PR) 6 | 524.4 | 611.8 | 699.7 | 812.9 | 898.7 |
| V(PR) 7 | 407.3 | 434.9 | 518.6 | 618.0 | 699.7 |
| VTHETA PR6 | -411.2 | -502.6 | -599.5 | -710.5 | -824.6 |
| VTHETA PR7 | -150.2 | -261.9 | -368.8 | -478.8 | -564.5 |
| U 6 | 493.24 | 585.42 | 677.59 | 769.76 | 861.94 |
| U 7 | 535.53 | 615.90 | 690.77 | 770.08 | 852.97 |
| M 6 | 0.3034 | 0.3244 | 0.3343 | 0.3432 | 0.3253 |
| M 7 | 0.4825 | 0.4409 | 0.4322 | 0.4324 | 0.4441 |
| M(PR) 6 | 0.4740 | 0.5537 | 0.6337 | 0.7276 | 0.8135 |
| M(PR) 7 | 0.3633 | 0.3867 | 0.4608 | 0.5493 | 0.6172 |
| TURN(PR) | 30.008 | 18.217 | 13.632 | 11.453 | 12.667 |
| $\bar{\omega}$ | 0.0157 | 0.0235 | 0.0489 | 0.0815 | 0.1128 |
| DFAC | .4400 | .4661 | .4064 | .3593 | .3909 |
| EFFP | 0.9631 | 0.9602 | 1.0349 | 1.0406 | 0.9610 |
| EFF | 0.9673 | 0.9592 | 1.0359 | 1.0418 | 0.9597 |
| INCIDM | 3.049 | 2.773 | 2.864 | 2.636 | 3.366 |
| DEVM | 2.834 | 4.531 | 3.227 | 2.182 | 0.999 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 80PERCENT SPEED PT.202 | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| | INTERMEDIATE | 4832. | 217.9 |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.650 | 14.543 | 13.138 | 9.951 | 5.800 |
| V 3 | 343.02 | 362.78 | 375.11 | 381.70 | 382.19 |
| V 4 | 373.55 | 398.92 | 409.72 | 415.77 | 407.85 |
| VZ 3 | 342.98 | 362.36 | 375.08 | 381.68 | 382.16 |
| VZ 4 | 359.70 | 384.14 | 398.98 | 409.52 | 405.76 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 100.77 | 100.17 | 93.13 | 71.85 | 41.22 |
| M 3 | 0.3102 | 0.3284 | 0.3399 | 0.3460 | 0.3464 |
| M 4 | 0.3384 | 0.3620 | 0.3720 | 0.3777 | 0.3703 |
| TURN | -15.65 | -14.54 | -13.14 | -9.95 | -5.80 |
| $\bar{\omega}$ | (REFER TO 70% & 100% SPEED DATA) | | | | |
| DFAC | 0.062 | 0.040 | 0.033 | 0.065 | -0.013 |
| EFFP | 0.8546 | 0.9318 | 0.8483 | 0.9356 | 0.7104 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | 5.050 | 4.457 | 4.062 | 5.649 | 9.500 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 33.498 | 32.236 | 30.495 | 28.229 | 22.249 |
| BETA 10 | 15.273 | 13.348 | 13.081 | 12.570 | 12.433 |
| V 9 | 588.01 | 545.10 | 520.68 | 519.75 | 509.52 |
| V 10 | 552.26 | 526.71 | 508.02 | 509.90 | 526.18 |
| VZ 9 | 482.69 | 458.09 | 447.74 | 457.85 | 471.52 |
| VZ 10 | 529.82 | 508.94 | 493.84 | 497.58 | 513.77 |
| V-THETA 9 | 324.52 | 290.76 | 264.23 | 245.84 | 192.92 |
| V-THETA 10 | 145.47 | 121.59 | 114.98 | 110.97 | 113.28 |
| M 9 | 0.5303 | 0.4902 | 0.4671 | 0.4654 | 0.4555 |
| M 10 | 0.4964 | 0.4729 | 0.4552 | 0.4562 | 0.4710 |
| TURN | 18.225 | 18.888 | 17.414 | 15.659 | 9.816 |
| $\bar{\omega}$ | 0.1171 | 0.0687 | 0.0922 | 0.1205 | 0.0761 |
| DFAC | 0.1722 | 0.1601 | 0.1498 | 0.1400 | 0.0442 |
| EFFP | 0.1713 | 0.0341 | -0.5561 | -1.9369 | 1.7692 |
| INCIDM | -11.902 | -9.364 | -8.705 | -10.271 | -18.251 |
| DEVM | 10.973 | 7.848 | 7.581 | 7.570 | 8.333 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.016 | 13.210 | 11.949 | 9.309 | 5.102 |
| BETA 7 | 35.014 | 33.789 | 32.045 | 29.543 | 24.649 |
| BETA(PR) 6 | 45.328 | 49.439 | 54.172 | 58.242 | 62.846 |
| BETA(PR) 7 | 22.057 | 35.750 | 44.199 | 49.864 | 55.190 |
| V 6 | 403.01 | 428.64 | 433.64 | 438.21 | 424.25 |
| V 7 | 591.10 | 533.29 | 509.64 | 504.80 | 494.35 |
| VZ 6 | 390.93 | 417.02 | 424.17 | 432.42 | 422.57 |
| VZ 7 | 481.97 | 442.81 | 431.78 | 439.11 | 449.30 |
| V-THETA 6 | 97.61 | 97.95 | 89.78 | 70.89 | 37.72 |
| V-THETA 7 | 339.16 | 296.58 | 270.41 | 248.90 | 206.18 |
| V(PR) 6 | 556.1 | 641.5 | 724.7 | 821.6 | 925.9 |
| V(PR) 7 | 522.4 | 546.1 | 602.6 | 681.3 | 787.3 |
| VTHETA PR6 | -395.4 | -487.2 | -587.5 | -698.6 | -823.9 |
| VTHETA PR7 | -196.2 | -319.1 | -420.1 | -520.9 | -646.4 |
| U 6 | 493.04 | 585.17 | 677.31 | 769.44 | 861.58 |
| U 7 | 535.31 | 615.64 | 690.49 | 769.76 | 852.62 |
| M 6 | 0.3658 | 0.3897 | 0.3944 | 0.3987 | 0.3856 |
| M 7 | 0.5332 | 0.4791 | 0.4568 | 0.4515 | 0.4414 |
| M(PR) 6 | 0.5048 | 0.5833 | 0.6592 | 0.7475 | 0.8416 |
| M(PR) 7 | 0.4712 | 0.4906 | 0.5401 | 0.6093 | [illegible] |
| TURN(PR) | 23.265 | 13.671 | 9.968 | 8.377 | 7.647 |
| $\bar{\omega}$ | 0.0070 | 0.0265 | 0.0561 | 0.0690 | 0.1026 |
| DFAC | .2250 | .2734 | .2743 | .2675 | .2348 |
| EFFP | 1.0151 | 1.0262 | 1.0086 | 0.9687 | 0.9826 |
| EFF | 1.0154 | 1.0267 | 1.0088 | 0.9680 | 0.9822 |
| INCIDM | -3.272 | -3.061 | -1.928 | -1.358 | -0.354 |
| DEVM | 3.257 | 3.250 | 2.099 | 1.264 | 2.299 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| 100 PERCENT SPEED PT.197 | INTERMEDIATE | 6060. | 190. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.774 | 15.136 | 14.048 | 12.582 | 13.982 |
| V 3 | 294.38 | 311.69 | 324.19 | 330.67 | 330.94 |
| V 4 | 314.60 | 337.80 | 348.94 | 361.60 | 367.10 |
| VZ 3 | 294.38 | 311.25 | 324.17 | 330.66 | 330.92 |
| VZ 4 | 302.75 | 323.61 | 338.48 | 352.88 | 356.23 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 85.52 | 88.20 | 84.70 | 78.77 | 88.70 |
| M 3 | 0.2655 | 0.2814 | 0.2929 | 0.2988 | 0.2991 |
| M 4 | 0.2841 | 0.3054 | 0.3157 | 0.3274 | 0.3324 |
| TURN | -15.77 | -15.14 | -14.05 | -12.58 | -13.98 |
| $\bar{\omega}$ | 0.0180 | | 0.0260 | | 0.0170 |
| DFAC | 0.080 | 0.060 | 0.055 | 0.026 | 0.025 |
| EFFP | 0.9392 | 0.9900 | 0.9178 | 1.0386 | 1.0181 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | -4.926 | -3.864 | -3.152 | -3.018 | -1.318 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 57.915 | 58.129 | 50.346 | 47.702 | 49.397 |
| BETA 10 | 21.730 | 13.812 | 8.691 | 10.651 | 16.202 |
| V 9 | 613.52 | 575.68 | 567.82 | 613.82 | 613.96 |
| V 10 | 245.00 | 364.51 | 357.73 | 415.08 | 529.26 |
| VZ 9 | 318.98 | 300.52 | 360.94 | 412.99 | 399.48 |
| VZ 10 | 224.61 | 349.45 | 351.99 | 407.73 | 508.15 |
| V-THETA 9 | 519.82 | 488.89 | 437.17 | 454.02 | 466.14 |
| V-THETA 10 | 90.71 | 87.02 | 54.06 | 76.72 | 147.67 |
| M 9 | 0.5393 | 0.5034 | 0.4966 | 0.5347 | 0.5307 |
| M 10 | 0.2104 | 0.3141 | 0.3084 | 0.3569 | 0.4548 |
| TURN | 36.186 | 44.318 | 41.655 | 37.051 | 33.195 |
| $\bar{\omega}$ | 0.4518 | 0.1987 | 0.3017 | 0.3220 | 0.1288 |
| DFAC | 0.8640 | 0.6540 | 0.6674 | 0.6103 | 0.3915 |
| EFFP | 0.5275 | 0.6718 | 0.4608 | 0.4080 | 0.7288 |
| INCIDM | 12.515 | 16.529 | 11.146 | 9.202 | 8.897 |
| DEVM | 17.430 | 8.312 | 3.191 | 5.651 | 12.102 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.490 | 14.299 | 12.910 | 11.574 | 12.989 |
| BETA 7 | 57.662 | 59.319 | 52.339 | 49.199 | 50.692 |
| BETA(PR) 6 | 59.120 | 62.204 | 64.630 | 66.581 | 69.489 |
| BETA(PR) 7 | 21.588 | 42.774 | 50.713 | 52.647 | 57.051 |
| V 6 | 330.78 | 352.33 | 372.83 | 391.92 | 381.90 |
| V 7 | 635.41 | 579.61 | 562.88 | 598.47 | 610.63 |
| VZ 6 | 320.17 | 340.99 | 363.30 | 383.91 | 372.12 |
| VZ 7 | 337.46 | 295.40 | 343.66 | 390.94 | 386.81 |
| V-THETA 6 | 82.77 | 87.02 | 83.30 | 78.63 | 85.84 |
| V-THETA 7 | 536.86 | 498.48 | 445.60 | 453.04 | 472.48 |
| V(PR) 6 | 624.0 | 731.4 | 848.0 | 965.9 | 1062.0 |
| V(PR) 7 | 365.5 | 402.9 | 543.1 | 644.5 | 711.2 |
| VTHETA PR6 | -535.6 | -646.9 | -766.1 | -886.4 | -994.7 |
| VTHETA PR7 | -134.5 | -273.6 | -420.4 | -512.3 | -596.8 |
| U 6 | 618.34 | 733.89 | 849.44 | 964.99 | 1080.54 |
| U 7 | 671.36 | 772.10 | 865.97 | 965.39 | 1069.37 |
| M 6 | 0.2989 | 0.3188 | 0.3377 | 0.3555 | 0.3462 |
| M 7 | 0.5599 | 0.5070 | 0.4921 | 0.5210 | 0.5280 |
| M(PR) 6 | 0.5639 | 0.6618 | 0.7682 | 0.8761 | 0.9626 |
| M(PR) 7 | 0.3220 | 0.3524 | 0.4748 | 0.5611 | 0.6150 |
| TURN(PR) | 37.533 | 19.401 | 13.911 | 13.932 | 12.438 |
| $\bar{\omega}$ | 0.0597 | 0.1840 | 0.2781 | 0.2405 | 0.2149 |
| DFAC | .6849 | .6728 | .5401 | .5058 | .5008 |
| EFFP | 0.9140 | 0.9000 | 0.9827 | 0.9678 | 0.9156 |
| EFF | 0.9102 | 0.8956 | 0.9819 | 0.9660 | 0.9107 |
| INCIDM | 10.529 | 9.704 | 8.530 | 6.981 | 6.289 |
| DEVM | 2.788 | 10.274 | 8.613 | 4.047 | 4.151 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 100PERCENT SPEED | PT.198 | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| | | INTERMEDIATE | 6063. | 199. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.717 | 15.057 | 13.749 | 11.680 | 12.674 |
| V 3 | 308.36 | 326.80 | 339.95 | 347.29 | 348.49 |
| V 4 | 330.50 | 352.93 | 367.52 | 381.20 | 384.24 |
| VZ 3 | 308.35 | 326.35 | 339.94 | 347.27 | 348.48 |
| VZ 4 | 318.14 | 338.16 | 356.97 | 373.30 | 374.88 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 89.53 | 91.68 | 87.35 | 77.17 | 84.30 |
| M 3 | 0.2783 | 0.2953 | 0.3074 | 0.3141 | 0.3152 |
| M 4 | 0.2987 | 0.3193 | 0.3328 | 0.3455 | 0.3483 |
| TURN | -15.72 | -15.06 | -13.75 | -11.68 | -12.67 |
| $\bar{\omega}$ | 0.0170 | | 0.0235 | | 0.0190 |
| DFAC | 0.077 | 0.062 | 0.048 | 0.014 | 0.018 |
| EFFP | 0.9135 | 0.9454 | 0.9167 | 1.0254 | 1.0019 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | -4.983 | -3.943 | -3.451 | -3.920 | -2.626 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 57.959 | 55.049 | 49.649 | 47.434 | 48.794 |
| BETA 10 | 23.487 | 14.414 | 11.063 | 12.669 | 15.159 |
| V 9 | 618.83 | 581.51 | 572.26 | 616.45 | 641.15 |
| V 10 | 261.08 | 381.82 | 376.77 | 435.03 | 556.32 |
| VZ 9 | 321.21 | 329.42 | 368.96 | 416.77 | 422.36 |
| VZ 10 | 236.43 | 365.04 | 367.90 | 424.05 | 536.95 |
| V-THETA 9 | 524.56 | 476.63 | 436.11 | 454.02 | 482.37 |
| V-THETA 10 | 104.05 | 95.04 | 72.30 | 95.41 | 145.47 |
| M 9 | 0.5441 | 0.5097 | 0.5009 | 0.5369 | 0.5545 |
| M 10 | 0.2242 | 0.3298 | 0.3253 | 0.3743 | 0.4780 |
| TURN | 34.472 | 40.635 | 38.586 | 34.765 | 33.635 |
| $\bar{\omega}$ | 0.4465 | 0.1896 | 0.2814 | 0.2999 | 0.1004 |
| DFAC | 0.8335 | 0.6131 | 0.6217 | 0.5655 | 0.3891 |
| EFFP | 0.5202 | 0.6593 | 0.4913 | 0.4301 | 0.6515 |
| INCIDM | 12.559 | 13.449 | 10.449 | 8.934 | 8.294 |
| DEVM | 19.87 | 8.914 | 5.563 | 7.669 | 11.059 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | [illegible] |
| BETA 6 | 14.509 | 14.126 | 12.707 | 10.829 | [illegible] |
| BETA 7 | 57.721 | 56.345 | 51.339 | 48.977 | [illegible] |
| BETA(PR) 6 | 57.823 | 60.898 | 63.493 | 65.651 | [illegible] |
| BETA(PR) 7 | 20.722 | 41.475 | 49.932 | 52.375 | [illegible] |
| V 6 | 345.84 | 370.08 | 390.67 | 409.44 | [illegible] |
| V 7 | 641.24 | 584.21 | 568.17 | 601.19 | [illegible] |
| VZ 6 | 334.72 | 358.44 | 391.00 | 402.11 | [illegible] |
| VZ 7 | 340.09 | 323.38 | 354.60 | 394.49 | [illegible] |
| V-THETA 6 | 86.65 | 90.32 | 85.93 | 76.93 | 92.12 |
| V-THETA 7 | 542.14 | 486.29 | 443.48 | 453.57 | 482.74 |
| V(PR) 6 | 628.6 | 737.2 | 853.7 | 975.3 | 1074.4 |
| V(PR) 7 | 366.1 | 432.1 | 552.0 | 546.7 | [illegible] |
| VTHETA PR6 | -532.0 | -643.9 | -763.9 | -888.5 | [illegible] |
| VTHETA PR7 | -129.6 | -286.2 | -422.7 | -512.3 | -596.1 |
| U 6 | 618.65 | 734.25 | 849.96 | 965.47 | [illegible] |
| U 7 | 671.69 | 772.48 | 866.40 | 965.87 | [illegible] |
| M 6 | 0.3128 | 0.3352 | 0.3542 | 0.3718 | [illegible] |
| M 7 | 0.5651 | 0.5122 | 0.4972 | 0.5234 | [illegible] |
| M(PR) 6 | 0.5685 | 0.6677 | 0.7742 | 0.8856 | [illegible] |
| M(PR) 7 | 0.3226 | 0.3789 | 0.4831 | 0.5030 | [illegible] |
| TURN(PR) | 37.094 | 19.392 | 13.505 | 13.254 | [illegible] |
| $\bar{\omega}$ | 0.0549 | 0.1405 | 0.2314 | 0.1745 | 0.1462 |
| DFAC | .6872 | .6276 | .5305 | .5093 | .5198 |
| EFFP | 0.8939 | 0.9304 | 0.9839 | 0.9532 | [illegible] |
| EFF | 0.8894 | 0.9273 | 0.9832 | 0.9557 | [illegible] |
| INCIDM | 9.223 | 8.398 | 7.393 | 6.051 | 5.200 |
| DEVM | 1.922 | 8.975 | 7.882 | 3.795 | 3.459 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 100PERCENT SPEED | CONFIGURATION | $N/\sqrt{\theta}$ | $\omega\sqrt{\theta}/\delta$ |
|---|---|---|---|
| PT.199 | INTERMEDIATE | 6036. | 216. |

### INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 16.025 | 14.911 | 13.420 | 11.081 | 11.235 |
| V 3 | 341.44 | 361.00 | 373.22 | 378.38 | 375.55 |
| V 4 | 362.47 | 388.70 | 403.69 | 416.61 | 422.02 |
| VZ 3 | 341.43 | 360.46 | 373.20 | 378.36 | 375.53 |
| VZ 4 | 348.36 | 373.48 | 392.55 | 408.74 | 413.92 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 100.06 | 100.02 | 93.69 | 80.07 | 82.23 |
| M 3 | 0.3087 | 0.3268 | 0.3381 | 0.3429 | 0.3403 |
| M 4 | 0.3282 | 0.3525 | 0.3664 | 0.3785 | 0.3835 |
| TURN | -16.02 | -14.91 | -13.42 | -11.08 | -11.24 |
| $\bar{\omega}$ | 0.0200 | | 0.0256 | | 0.0210 |
| DFAC | 0.089 | 0.064 | 0.045 | 0.105 | -0.014 |
| EFFP | 0.8425 | 0.9404 | 0.8927 | 0.9936 | 0.9294 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | -4.675 | -4.089 | -3.780 | -4.519 | -4.065 |

### STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 52.108 | 50.348 | 45.569 | 42.203 | 47.430 |
| BETA 10 | 16.492 | 14.620 | 12.925 | 13.330 | 15.018 |
| V 9 | 632.48 | 608.89 | 601.19 | 642.71 | 669.38 |
| V 10 | 316.38 | 419.03 | 423.90 | 475.81 | 560.68 |
| VZ 9 | 381.10 | 385.46 | 420.02 | 476.11 | 451.82 |
| VZ 10 | 299.69 | 401.74 | 412.21 | 462.96 | 541.22 |
| V-THETA 9 | 499.13 | 468.80 | 429.31 | 431.75 | 493.44 |
| V-THETA 10 | 89.76 | 105.93 | 94.07 | 109.77 | 145.29 |
| M 9 | 0.5591 | 0.5362 | 0.5287 | 0.5636 | 0.5932 |
| M 10 | 0.2734 | 0.3637 | 0.3677 | 0.4122 | 0.4846 |
| TURN | 35.626 | 35.719 | 32.744 | 28.864 | 32.472 |
| $\bar{\omega}$ | 0.4153 | 0.1983 | 0.2207 | 0.2070 | 0.0773 |
| DFAC | 0.7434 | 0.5566 | 0.5405 | 0.4932 | 0.4165 |
| EFFP | 0.5395 | 0.6824 | 0.6144 | 0.6722 | 0.9591 |
| INCIDM | 6.708 | 8.748 | 6.369 | 3.703 | 6.990 |
| DEVM | 12.182 | 9.129 | 7.325 | 8.339 | 10.918 |

### ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.395 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.594 | 13.774 | 12.230 | 10.192 | 11.030 |
| BETA 7 | 52.114 | 51.661 | 47.249 | 43.773 | 46.577 |
| BETA(PR) 6 | 54.350 | 57.605 | 60.660 | 63.196 | 66.834 |
| BETA(PR) 7 | 20.769 | 37.640 | 46.723 | 49.754 | 52.589 |
| V 6 | 384.76 | 413.59 | 433.91 | 452.36 | 433.07 |
| V 7 | 654.22 | 609.02 | 592.71 | 622.42 | 655.43 |
| VZ 6 | 372.22 | 401.32 | 423.91 | 445.17 | 425.06 |
| VZ 7 | 398.84 | 377.30 | 402.04 | 449.32 | 450.51 |
| V-THETA 6 | 96.94 | 98.47 | 91.92 | 80.04 | 82.92 |
| V-THETA 7 | 516.33 | 477.69 | 435.23 | 430.59 | 476.04 |
| V(PR) 6 | 638.7 | 749.3 | 865.2 | 987.2 | 1080.5 |
| V(PR) 7 | 429.7 | 477.1 | 586.9 | 695.6 | 741.6 |
| VTHETA PR6 | -518.9 | -632.5 | -754.2 | -881.1 | -993.3 |
| VTHETA PR7 | -152.4 | -291.4 | -427.3 | -531.0 | -589.0 |
| U 6 | 615.80 | 730.98 | 846.08 | 961.17 | 1076.26 |
| U 7 | 668.70 | 769.04 | 862.54 | 961.56 | 1065.07 |
| M 6 | 0.3488 | 0.3757 | 0.3947 | 0.4120 | 0.3939 |
| M 7 | 0.5795 | 0.5364 | 0.5209 | 0.5451 | 0.5707 |
| M(PR) 6 | 0.5790 | 0.6806 | 0.7870 | 0.8992 | 0.9827 |
| M(PR) 7 | 0.3807 | 0.4202 | 0.5159 | 0.6093 | 0.6457 |
| TURN(PR) | 33.572 | 19.941 | 13.928 | 13.440 | 14.245 |
| $\bar{\omega}$ | 0.0144 | 0.0693 | 0.1162 | 0.0822 | 0.1062 |
| DFAC | .5724 | .5649 | .4894 | .4539 | .4840 |
| EFFP | 0.9479 | 0.9608 | 1.0019 | 0.9870 | 0.9393 |
| EFF | 0.9456 | 0.9590 | 1.0020 | 0.9864 | 0.9359 |
| INCIDM | 5.750 | 5.105 | 4.560 | 3.596 | 3.634 |
| DEVM | 1.969 | 5.140 | 4.623 | 1.154 | -0.311 |

## Table B-4. Blade Element Data Intermediate Configuration (Continued)

| 100PERCENT SPEED | PT.200 | CONFIGURATION INTERMEDIATE | $N/\sqrt{\theta}$ 6047. | $\omega\sqrt{\theta}/\delta$ 238. |
|---|---|---|---|---|

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.996 | 14.647 | 13.506 | 10.145 | 7.616 |
| V 3 | 379.33 | 401.76 | 416.97 | 424.52 | 420.25 |
| V 4 | 408.20 | 435.66 | 449.21 | 461.04 | 475.67 |
| VZ 3 | 379.31 | 401.22 | 416.96 | 424.50 | 420.23 |
| VZ 4 | 392.39 | 418.84 | 436.72 | 453.74 | 471.45 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 112.49 | 110.16 | 104.91 | 81.21 | 63.04 |
| M 3 | 0.3438 | 0.3646 | 0.3788 | 0.3859 | 0.3819 |
| M 4 | 0.3706 | 0.3963 | 0.4091 | 0.4202 | 0.4340 |
| TURN | -16.00 | -14.65 | -13.51 | -10.14 | -7.62 |
| $\bar{\omega}$ | 0.0180 | | 0.0253 | | 0.0200 |
| DFAC | 0.076 | 0.055 | 0.049 | 0.010 | -0.057 |
| EFFP | 0.9076 | 0.9780 | 0.9062 | 0.9822 | 0.8947 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | -4.704 | -4.353 | -3.694 | -5.455 | -7.684 |

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 45.407 | 45.786 | 40.498 | 37.043 | 43.803 |
| BETA 10 | 15.357 | 13.601 | 12.678 | 12.401 | 11.625 |
| V 9 | 650.69 | 614.48 | 608.01 | 625.79 | 616.42 |
| V 10 | 438.03 | 469.81 | 482.39 | 520.23 | 582.80 |
| VZ 9 | 448.09 | 424.42 | 460.92 | 499.47 | 443.76 |
| VZ 10 | 418.97 | 451.90 | 468.97 | 507.93 | 570.68 |
| V-THETA 9 | 463.36 | 440.42 | 394.86 | 376.98 | 426.67 |
| V-THETA 10 | 116.00 | 110.48 | 105.87 | 111.72 | 117.44 |
| M 9 | 0.5791 | 0.5438 | 0.5381 | 0.5522 | 0.5379 |
| M 10 | 0.3829 | 0.4108 | 0.4224 | 0.4551 | 0.5075 |
| TURN | 30.050 | 32.185 | 27.820 | 24.642 | 32.177 |
| $\bar{\omega}$ | 0.2330 | 0.0980 | 0.1309 | 0.1328 | 0.0535 |
| DFAC | 0.5267 | 0.4557 | 0.4156 | 0.3663 | 0.2996 |
| EFFP | 0.6555 | 0.7714 | 0.6758 | 0.6611 | 0.9317 |
| INCIDM | 0.007 | 4.186 | 1.298 | -1.457 | 3.303 |
| DEVM | 11.057 | 8.101 | 7.178 | 7.401 | 7.525 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 14.549 | 13.560 | 12.321 | 9.295 | [illegible] |
| BETA 7 | 46.061 | 47.244 | 47.560 | 38.605 | 29.434 |
| BETA(PR) 6 | 50.460 | 54.310 | 57.827 | [illegible] | 64.190 |
| BETA(PR) 7 | 22.261 | 37.640 | 46.256 | 51.358 | 54.001 |
| V 6 | 433.48 | 461.56 | 479.38 | 496.13 | 495.74 |
| V 7 | 667.17 | 612.52 | 596.50 | 605.49 | 614.03 |
| VZ 6 | 419.46 | 448.29 | 468.78 | 491.55 | [illegible] |
| VZ 7 | 460.19 | 415.35 | 439.04 | 473.05 | 473.88 |
| V-THETA 6 | 108.90 | 108.22 | 102.42 | 80.45 | [illegible] |
| V-THETA 7 | 480.41 | 449.75 | 403.45 | 377.79 | [illegible] |
| V(PR) 6 | 659.0 | 768.6 | 880.5 | 1010.2 | [illegible] |
| V(PR) 7 | 500.2 | 525.1 | 636.6 | 752.8 | [illegible] |
| VTHETA PR6 | -598.1 | -624.1 | -745.2 | -887.5 | [illegible] |
| VTHETA PR7 | -189.5 | -320.7 | -460.7 | -585.5 | -676.4 |
| U 6 | 617.01 | 732.32 | 847.42 | 962.97 | [illegible] |
| U 7 | 669.92 | 770.44 | 864.11 | 963.32 | [illegible] |
| M 6 | 0.3943 | 0.4207 | 0.4381 | 0.4554 | 0.4531 |
| M 7 | 0.5948 | 0.5420 | 0.5274 | 0.5337 | 0.5342 |
| M(PR) 6 | 0.5994 | 0.7006 | 0.8037 | 0.9234 | [illegible] |
| M(PR) 7 | 0.4460 | 0.4646 | 0.5628 | 0.6535 | 0.7213 |
| TURN(PR) | 28.191 | 16.646 | 11.444 | 9.822 | [illegible] |
| $\bar{\omega}$ | -0.0255 | 0.0278 | 0.0362 | 0.0784 | 0.1277 |
| DFAC | .4525 | .4946 | .4218 | .3863 | .4055 |
| EFFP | 0.9810 | 0.9594 | 1.0448 | 1.0458 | [illegible] |
| EFF | 0.9803 | 0.9578 | 1.0467 | 1.0479 | [illegible] |
| INCIDM | 1.860 | 1.810 | 1.727 | 1.282 | 0.989 |
| DEVM | 3.461 | 5.140 | 4.256 | 2.458 | 2.091 |

# Table B-4. Blade Element Data Intermediate Configuration (Continued)

| | | CONFIGURATION | $N/\sqrt{\theta}$ | $w\sqrt{\theta}/\delta$ |
|---|---|---|---|---|
| 100PERCENT SPEED | PT.196 | INTERMEDIATE | 6059. | 262. |

INLET GUIDE VANE

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 3 | 21.150 | 26.050 | 30.950 | 35.850 | 40.750 |
| BETA 3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| BETA 4 | 15.753 | 14.682 | 13.093 | 10.359 | 6.933 |
| V 3 | 428.60 | 452.65 | 466.99 | 473.76 | 473.69 |
| V 4 | 466.03 | 496.52 | 514.37 | 519.44 | 510.79 |
| VZ 3 | 428.55 | 452.09 | 466.96 | 473.73 | 473.66 |
| VZ 4 | 448.50 | 478.18 | 500.93 | 510.95 | 507.05 |
| V-THETA 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| V-THETA 4 | 126.52 | 125.85 | 116.52 | 93.40 | 61.65 |
| M 3 | 0.3897 | 0.4123 | 0.4258 | 0.4322 | 0.4322 |
| M 4 | 0.4249 | 0.4538 | 0.4708 | 0.4757 | 0.4674 |
| TURN | -15.75 | -14.68 | -13.09 | -10.36 | -6.93 |
| $\bar{\omega}$ | 0.0200 | | 0.0231 | | 0.0190 |
| DFAC | 0.064 | 0.044 | 0.024 | 0.003 | -0.013 |
| EFFP | 0.9195 | 0.9238 | 0.9435 | 0.9794 | 0.8262 |
| INCIDM | -20.200 | -20.200 | -20.200 | -20.200 | -20.200 |
| DEVM | -4.947 | -4.318 | -4.107 | -5.241 | -8.367 |

STATOR 1

STATOR B

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 9 | 26.021 | 29.683 | 33.345 | 37.007 | 40.669 |
| BETA 9 | 31.691 | 32.216 | 30.252 | 26.822 | 25.493 |
| BETA 10 | 14.236 | 13.249 | 12.369 | 10.727 | 12.562 |
| V 9 | 725.70 | 678.77 | 645.51 | 634.24 | 651.66 |
| V 10 | 679.72 | 642.88 | 612.45 | 596.71 | 636.76 |
| VZ 9 | 608.43 | 571.22 | 556.90 | 565.99 | 588.06 |
| VZ 10 | 654.96 | 622.26 | 597.48 | 586.28 | 621.33 |
| V-THETA 9 | 381.24 | 361.86 | 325.21 | 286.18 | 280.47 |
| V-THETA 10 | 167.15 | 147.33 | 131.19 | 111.07 | 138.49 |
| M 9 | 0.6581 | 0.6119 | 0.5799 | 0.5688 | 0.5824 |
| M 10 | 0.6132 | 0.5774 | 0.5483 | 0.5332 | 0.5685 |
| TURN | 17.455 | 18.967 | 17.883 | 16.095 | 12.931 |
| $\bar{\omega}$ | 0.1101 | 0.0915 | 0.0938 | 0.1300 | 0.0719 |
| DFAC | 0.1715 | 0.1816 | 0.1829 | 0.1879 | 0.1297 |
| EFFP | 0.3036 | 0.3258 | 0.2427 | 0.0740 | 0.5472 |
| INCIDM | -13.709 | - 9.384 | - 8.948 | -11.678 | -15.007 |
| DEVM | 9.936 | 7.749 | 6.869 | 5.727 | 8.462 |

ROTOR

| PCT SPAN | 90 | 70 | 50 | 30 | 10 |
|---|---|---|---|---|---|
| DIA 6 | 23.385 | 27.755 | 32.125 | 36.495 | 40.865 |
| BETA 6 | 13.943 | 13.200 | 11.905 | 9.560 | 6.657 |
| BETA 7 | 33.167 | 33.808 | 31.793 | 28.509 | 25.368 |
| BETA(PR) 6 | 45.106 | 49.151 | 53.732 | 58.037 | 62.867 |
| BETA(PR) 7 | 24.270 | 36.304 | 44.923 | 51.547 | 54.176 |
| V 6 | 508.90 | 542.07 | 551.63 | 552.49 | 525.94 |
| V 7 | 726.06 | 661.58 | 629.91 | 609.40 | 636.33 |
| VZ 6 | 493.79 | 527.43 | 539.65 | 544.78 | 522.39 |
| VZ 7 | 604.99 | 549.16 | 535.11 | 535.41 | 574.96 |
| V-THETA 6 | 122.62 | 123.79 | 113.79 | 91.75 | 60.97 |
| V-THETA 7 | 397.21 | 368.11 | 331.87 | 290.87 | 272.62 |
| V(PR) 6 | 699.7 | 806.6 | 912.3 | 1029.1 | 1145.5 |
| V(PR) 7 | 666.7 | 682.1 | 756.2 | 861.1 | 982.4 |
| VTHETA PR6 | -495.6 | -610.0 | -735.5 | -873.1 | -1019.4 |
| VTHETA PR7 | -274.0 | -403.9 | -534.0 | -674.4 | -796.5 |
| U 6 | 618.24 | 733.77 | 849.30 | 964.83 | 1080.36 |
| U 7 | 671.24 | 771.97 | 865.82 | 965.23 | 1069.13 |
| M 6 | 0.4656 | 0.4974 | 0.5066 | 0.5075 | 0.4819 |
| M 7 | 0.6585 | 0.5953 | 0.5650 | 0.5453 | 0.5681 |
| M(PR) 6 | 0.6402 | 0.7402 | 0.8379 | 0.9453 | 1.0496 |
| M(PR) 7 | 0.6046 | 0.6138 | 0.6782 | 0.7705 | 0.8770 |
| TURN(PR) | 20.829 | 12.830 | 8.804 | 6.488 | 8.691 |
| $\bar{\omega}$ | 0.0200 | 0.0460 | 0.0922 | 0.1054 | 0.1422 |
| DFAC | .1961 | .2764 | .2727 | .2496 | .2288 |
| EFFP | 1.0806 | 1.0289 | 0.9883 | 0.9572 | 0.9559 |
| EFF | 1.0832 | 1.0298 | 0.9880 | 0.9560 | 0.9544 |
| INCIDM | -3.494 | -3.349 | -2.368 | -1.563 | -0.333 |
| DEVM | 5.470 | 3.804 | 2.823 | 2.947 | 1.276 |

APPENDIX C

Method of Deducing Rotating Stall Characteristics

The number, rotational speed, and size of rotating stall zones were determined from the results obtained with three Kistler high response pressure transducers located at Station 2, 10% of span from the outer wall, and spaced 30 and 60 degrees apart, respectively. A set of representative transducer signal traces is presented in figure C-1 to illustrate the method used. The method is predicated on a maximum number of stall zones equal to twelve, and equal rotational speed for all zones.

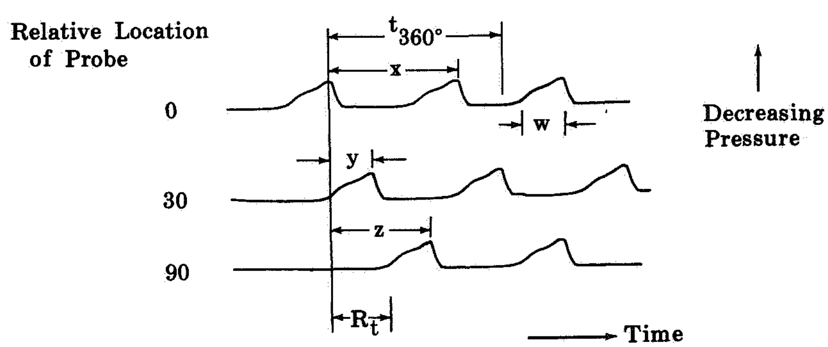


Figure C-1. Transducer Signal Diagram FD 25199

In figure C-1:

X = time between any two adjacent stall zones (or the cycle time of a single stall zone)

y = time for one of twelve or less stall zones to move from the 0-degree to the 30-degree probe.

z = time between a simultaneous stall zone intercept at the 0-degree probe and a stall zone intercept at the 90-degree probe.

w = the circumferential extent of a stall zone

$R_t$ = time for one rotor revolution

$t_{360^o}$ = time equivalent of 360 degrees on the transducer signal trace

The minimum angular spacing of stall zones is obtained from

$$\frac{30}{y/x}$$

Thus, if y = x, the minimum angular spacing would be 30 degrees. With the angular spacing known for any two adjacent zones, it is possible to identify the time-equivalent of 360 degrees on the transducer signal trace. The number of stall zones within this time period is the number of stall zones present. The rotational speed of the stall zone in terms of rotor speed is obtained from the ratio

$$\frac{R_t}{t_{360^\circ}}$$

The extent of the stall zone is

$$\frac{w}{t_{360^\circ}}$$

The third probe can be used for a check on the number of stall zones when the minimum spacing is equal to or greater than 60 or 90 degrees. The third probe also defines the direction of rotation of the stall zones, although this direction is usually that of the rotor.

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| 7. | Department of Navy<br>Bureau of Weapons<br>Washington, D. C. 20525<br>Attention:<br>Robert Brown, RAPP14 | | 1 |
| 8. | Department of Navy<br>Bureau of Ships<br>Washington, D. C. 20360<br>Attention:<br>G. L. Graves | | 1 |
| 9. | NASA-Langley Research Center<br>Technical Library<br>Hampton, Virginia 23365<br>Attention: | | |
| | Mark R. Nichols | | 1 |
| | John V. Becker | | 1 |
| 10. | The Boeing Company<br>Commercial Airplane Division<br>P. O. Box 3991<br>Seattle, Washington 98124<br>Attention:<br>G. J. Schott | MS 80-66 | 1 |
| 11. | Douglas Aircraft Company<br>3855 Lakewood Boulevard<br>Long Beach, California 90801<br>Attention:<br>J. E. Merriman | | 1 |
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13. Pratt & Whitney Aircraft
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    Department 8894, Plant 8
    P. O. Box 894
    Indianapolis, Indiana 46206
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16. General Electric Company
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17. General Electric Company
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18. Curtiss-Wright Corporation
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19. Air Research Manufacturing Company
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Phoenix, Arizona 85034
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| Robert O. Bullock | 1 |
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20. AiResearch Manufacturing Company
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| 21. | Union Carbide Corporation<br>Nuclear Division<br>Oak Ridge Gaseous Diffusion Plan<br>P. O. Box "P"<br>Oak Ridge, Tennessee 37830<br>Attention:<br>R. G. Jordan | 1 |
| 22. | Avco Corporation<br>Lycoming Division<br>550 South Main Street<br>Stratford, Connecticut<br>Attention:<br>Clause W. Bolton | 1 |
| 23. | Continental Aviation & Engineering Corp.<br>12700 Kercheval<br>Detroit, Michigan 48215<br>Attention:<br>Eli H. Benstein<br>Howard C. Walch | 1<br>1 |
| 24. | Solar<br>San Diego, California 92112<br>Attention:<br>P. A. Pitt<br>Mrs. L. Walper | 1<br>1 |
| 25. | Goodyear Atomic Corporation<br>Box 628<br>Piketon, Ohio<br>Attention:<br>C. O. Langebrake | 2 |
| 26. | Iowa State University of Science and Technology<br>Ames, Iowa 50010<br>Attention:<br>Professor George K. Serovy<br>Dept. of Mechanical Engineering | 1 |
| 27. | Hamilton Standard Division of United Aircraft Corporation<br>Windsor Locks, Connecticut<br>Attention:<br>Mr. Carl Rohrback<br>Head of Aerodynamics and Hydrodynamics | 1 |

28. Westinghouse Electric Corporation
Small Steam and Gas Turbine Engineering B-4
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Attention:
Mr. S. M. DeCorso — 1

29. J. Richard Joy
Supervisor, Analytical Section
Williams Research Corporation
P. O. Box 95
Walled Lake, Michigan — 1

30. Raymond S. Poppe
Building 541, Dept. 80-91
Lockheed Missile and Space Company
P. O. Box 879
Mountain View, California 94040 — 1

31. James D. Raisbeck
The Boeing Company
224 N. Wilkinson
Dayton, Ohio 45402 — 1

32. James Furlong
Chrysler Corporation
Research Office
Dept. 9000
P. O. Box 1118
Detroit, Michigan 48231 — 1

33. Elliott Company
Jeannette, Pennsylvania 15644
Attention:
J. Rodger Schields — 1
Director - Engineering